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UNIVERSITY OF CHICAGO

Education for Innovative Behavior in Executives[1]

Cooperative Research Project No. 975

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Section I

ABSTRACT

This report is a summary of a research project conducted as a Cooperative Research Project (No. 975) by the Center for Programs in Government Administration of the University of Chicago, in cooperation with the United States Office of Education. The research focusses upon the concept of innovative administrative behavior, defined in the project proposal (page 2) as "a consistent tendency to develop and consider novel solutions to administrative problems and to evaluate these solutions in terms of criteria other than (but not necessarily exclusive of) conformity to pre-existing practices."

Literature reviewed in the project proposal dated March 21, 1960 indicated that individual factors in creative activity which have received research attention include (a) cognitive aptitudes such as fluency, flexibility and redefinition, as components of creative ability, and (b) the personality characteristics of creative persons (e.g. openness to experience, self-determination). Another set of variables sometimes emphasized are environmental and situational variables which mediate and facilitate the expression of creativity. Variables for the Center's investigations were selected to include representatives of each of these groups of variables. Two major objectives were stated in the proposal (page 5): (1) To study the relationships of cognitive and personality variables and of organizational climate to innovative administrative behavior; and (2) to design experimental educational programs designed to stimulate innovative administrative behavior, but with differing curriculum emphases, and to assess their differential effects upon the performance of administrators drawn from distinct organizational climates.

The research relevant to objective (1), which will here be termed the predictor study, are summarized in Section III of this report. The design and evaluation of the programs proposed in objective (2) are described in Sections IV and

V; this research will be termed the experimental study. An additional series of studies focussed upon empirical attributes of innovative behavior assessments made by organizational associates, which served as criterion variables in the predictor study and, along with objective test scores, as dependent variables in the predictor study. These studies, referred to as methodological studies are summarized in Section II.

Methodological Studies

One hundred and ninety-eight persons holding administrative positions in some thirty agencies of the U. S. Government, participated as subjects in the methodological and predictor studies. Their grade levels ranged from 11 to 17 with a mean of 13.3. Ninety-five described their positions as "primarily line" and 103 described their positions as "primarily staff." Seventy-eight of the subjects represented "headquarters" agencies in the Washington, D. C. Area, and 120 represented "field" units from the Chicago Area.

Two methods for obtaining assessments of innovative behavior from organizational associates were developed. A cluster of rating scales consisted of 10 statements, each describing a facet of innovative behavior, for example "Approaches problems with flexibility; able to change assumptions and orientations in order to arrive at workable new decisions." Each statement was responded to in terms of a seven-point rating scale, with alternatives ranging from "perfectly describes the participant" to "could not be accurately applied to the participant." The second method, a forced choice procedure, utilized pairs of adjectives; one adjective of each pair describes a facet of innovative behavior (e.g., original), and the other describes a facet of behavior intended to be independent of innovativeness, but valuable in itself (e.g., dependable). Assessors selected the adjective of each pair that was more applicable to the subject, and the score was the number of "innovative" adjectives chosen.

Each subject was described by each of these methods by two assessors, the subject's immediate superior and a peer (a co-worker who knew him but was neither his superior nor his subordinate).

These measures were studied in conjunction with several other variables: (a) rating scale clusters assessing *attributes of administrators other than innovative behavior* (self confidence, cautiousness, discernment, analytic decision-making abilities, bureaucratic decision-making abilities, policy-making abilities, policy-implementing skills); (b) a set of rating scales assessing *general administrative effectiveness*; (c) a measure of each assessor's *attitude toward innovative behavior* as an attribute of a government administrator; and (d) a measure of the *organizational climate* of the subject's organization, as perceived by the subject himself.

The methodological research focussed upon: (a) the convergent and discriminant validity of the innovation measures; (b) the effect of assessors' attitudes upon correlations between assessments of innovativeness and of general effectiveness and (c) the effect of perceived organizational climate upon the correlation between assessments and of general effectiveness. The following conclusions were drawn:

(1) The measure based upon seven-point rating scales lacked sufficient discriminant validity to be useful as a measure of a discriminable component of executive performance. The other measure, based upon a forced-choice adjective-comparison technique showed more promise: its major correlates, both within and across assessors are other measures of innovative behavior, and of attributes conceptually and theoretically related to innovativeness.

(2) The rating scale measure is highly saturated with halo variance, as indicated by its correlations with ratings of "general effectiveness." The forced-choice measure is significantly correlated with general effectiveness ratings only when assessors report, by an independent measure, that they value innovative behavior highly.

(3) The relation between assessments of innovative behavior (via the forced-choice measure) and general effectiveness ratings depends upon "organizational climate." Peers are more likely to describe an executive as both "innovative" and "generally effective" when the organization is described as "group-centered." In superiors' assessments, this correlation is more likely to occur in organizations described as "rule-centered."

The Predictor Study

Relationships between the forced-choice assessments of innovative behavior and 28 cognitive and personality variables were studied in the sample of 198 administrators described above. The predictor variables were:[1]

(1) Cognitive variables

- (a) General Mental Ability: The Thurstone Test of Mental Alertness
- (b) Six cognitive aptitude variables selected from studies performed by J. P. Guilford and his associates: sensitivity to problems, ideational fluency, spontaneous flexibility, semantic redefinition penetration and originality.

(2) Personality variables

- (a) Self reports on "manifest needs" obtained via the Edwards Personal Preference Survey
- (b) The dominance, self acceptance and self control scales from the California Psychological Inventory
- (c) The Rokeach Dogmatism Scale.

The subjects also described their organizations by means of an Organizational Perception Instrument. This instrument yields a score indicating the extent to which the subject perceives his organization as "rule-centered" or "bureaucratic" as opposed to "group-centered" or "democratic." Data on the predictor variables and on organizational perceptions were obtained in testing sessions lasting one full day. Peers' and superiors' assessment questionnaires were distributed and collected by mail.

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[1] See Section III for bibliographic citations.

The results for the total sample are as follows:

1. Peer assessments of innovative behavior are predicted better by test measured characteristics than are superior assessments.
2. Significantly correlated with peer assessments were: sensitivity to problems, penetration, originality, lack of need for order, need for autonomy, and general mental ability.
3. Significantly correlated with superior assessments were: lack of need for order, need for aggression, and self-consistency in filling out the questionnaire.

In a subsample of the 60 subjects who most often described their organizations as "rule-centered," the following results were obtained:

1. Variables significantly correlated with peer assessments are: lack of need for intraception, need for aggression.
2. Variables significantly related to superiors' assessments of innovative behavior are: originality, lack of need for nurturance, need for heterosexuality, need for aggression, consistency, dominance, and general mental ability.

In a subsample of the 60 subjects who most often described their organizations as "group-centered," the results were as follows:

1. Variables significantly related to peer assessments are: five of six cognitive factors, lack of need for deference, lack of need for order, lack of need for endurance, and general mental ability.
2. Significantly related to superior ratings are: ideational fluency, penetration, need for nurturance, and lack of need for endurance.

In general, peers' assessments are more "predictable" by our measures in the total sample and in the group-centered sample; superiors' assessments are more predictable in the rule-centered sample.

The results of the methodological and predictor studies are discussed in terms of an hypothesis derived by Peter Blau and N. R. Scott (in their book Formal Organizations) from results of small group experiments. The hypothesis, simply stated is that a hierarchical organization of group members (i.e. one in which communication patterns are circuited through a designated member or members) facilitates coordination of responses, by restricting the flow of communication. Non-hierarchical organization, on the other hand, tends to facilitate the development of new ideas. This hypothesis may be applied to the present study if, as seems reasonable, rule-centered and group-centered organizations may be described as relatively hierarchical and non-hierarchical, respectively.

Such a characterization would be consistent with the overall finding that peers are more sensitive to test-measured characteristics of their co-workers in group-centered organizations, while superiors are more sensitive to characteristics of their subordinates in rule-centered organizations. In organizations that typically adopt "group-centered" practices, many decisions would be delegated to groups, and there would be expectations of productivity from these groups. Individual co-workers in such a situation might be expected to be sensitive to the contributions of individual group members, while superiors, receiving a group-made decision, would have less opportunity to observe individual contributions. In the rule-centered situation, on the other hand, peers would tend to work independently of one another, while the superior, with the task of coordinating the work of a number of individuals, would have closer contact with his subordinates, and would be more sensitive to their characteristics.

This hypothesis would also be consistent with the observed differences in patterns of relationship. Peers working together in a non-hierarchical structure would have more opportunity to observe the processes by which an individual arrives at decision than would either peers or superiors in a hierarchical relationship to the individual. These peers, therefore, might be expected to be more sensitive to the creative aptitudes of their co-workers. A superior, on the other hand, is more likely to observe his subordinates in a formal, reporting relationship, particularly in a rule-centered environment. The superior in such a situation is more likely to see the product of his subordinates' work, rather than the processes by which the product was accomplished. The subordinate in such a situation is likely, moreover, to be more or less self-consciously making a "presentation of self." The superior, in evaluating a subordinate's work and attempting to coordinate it with the work of other subordinates, is thus likely to be sensitive to interpersonal facets of behavior rather than to cognitive aptitudes. The subordinate who appears to be innovative is one who is dominant and aggressive in presenting his ideas and getting them adopted.

The Experimental Study

The experimental study involved three 5-session, 15 hour seminars for federal administrators -- two experimental seminars whose objectives are to encourage -- by different theoretical approaches -- increased innovative behavior, and a control seminar, whose content was based upon more "conventional" management development curricula. A second variable of classification was perceived organizational climate, the members of each group being categorized as seeing their organizations as "more rule-centered" or "more group-centered." A total of 127 subjects were distributed among the six cells in this 3 x 2 design. Two teachers were used, each teaching all three of the seminars. The samples were similar in composition to those used in the predictor study, except that all participants were from the Chicago area.

One of the experimental seminars -- called the "cognitive skills" treatment -- is based upon the postulate that creativity is a complex of cognitive skills, and thus that innovative behavior can be maximized by discussing with participants the nature of the component skills and their relation to creativity, and by permitting practice of the skills in a variety of contexts and with a variety of materials. The central concepts of the seminar are Gestalt formation, cognitive embeddedness and field articulation, divergent and convergent thinking, ideational fluency and flexibility, categorization, and suspended judgment. Materials and exercises for illustration and practice range from abstract problems to be solved to descriptions of socially complex situations whose results and implications are to be anticipated, and realistic organizational problems.

The premise of the second experimental seminar is that insight into the "creative process" and personal styles of administrators, rather than practice in particular skills, is important for producing innovative behavior. This seminar is referred to as the "personality-insight" treatment. The central concepts of the seminar include the distinction between self and role, the potential of the "central" or "autonomous" self, the effect on behavior of the individual's manner of "construing the environment," "primary process," or metaphoric thinking, and prejudice and dogmatism as blocks to innovation. Emphasis is on insight and self-awareness rather than practice, and pedagogical techniques include case discussion and role play exercises based upon George Kelly's "fixed role" concept.

The following dependent variables were used:

1. Superior and Peer Assessments: Rating scale and forced-choice measures of innovative behavior; rating of general administrative effectiveness.
2. Cognitive aptitude tests: Social Institutions, Apparatus, Brick Uses, Similarities, and Object Synthesis.
3. The Rokeach Dogmatism Scale.
4. The Remote Associates Test.

"Before" participation measures from objective tests were obtained one week before the seminars began; "after" participation measures were obtained immediately after the close of the last session. Measures from superiors and peers were distributed and collected by mail immediately before the beginning of the seminars and from two to three months after their conclusion.

Of the seven test-measured dependent variables, two were significantly related to course content: Brick Uses and Dogmatism Scale. Members of both experimental groups made a greater improvement on Brick Uses than did the members of the control group. On the Dogmatism Scale, members of the "personality-insight" seminar decreased in dogmatism, while members of the "cognitive" seminar increased, and control group members remained at about the same level. Both of these variables were also significantly related to organizational perceptions: persons who perceived their organizations as "rule-centered" made larger gains in Brick Uses, and showed larger decreases in dogmatism, on the average, than did persons who perceived their organizations as "group-centered." Finally, there was an interaction between course content and organizational perception with respect to the Dogmatism Scale: persons who were in the "personality" seminar, and who perceived their organizations as "rule-centered" decreased proportionately more in dogmatism than did any other subgroup.

None of the innovative-behavior assessments by superiors and peers were significantly related to course content. The superiors innovative behavior rating scale was related to organizational perception, the subjects who perceived their organizations as rule-centered gaining more than those who saw their organizations as group-centered.

The superiors' rating of general effectiveness was related to course content, the control group showing the greatest gain (a result consistent with the design of the seminar).

The results tended to favor the "personality-insight" course over the "cognitive skills" course. It seems plausible that the skills that were focussed upon were too specific for carry-over into testing situation under the time limitations of the course. The impact of the personality-insight seminar appears to take the form of changing set towards problems and situations, a goal that is more likely to be attained in a short time period.

In all instances in which the organizational perception variable has a significant effect, it was the subjects who perceived their organizations as rule-centered that improved more. This effect is apparently not attributable to differences in initial level on the variables. This finding substantiates the belief that certain identifiable groups of administrators have a greater need for and a greater susceptibility to certain kinds of education than others. Advantages of careful selection of students for executive education and of careful matching of students and curricula are thus indicated.

Section II

METHODOLOGICAL STUDIES

Assessments of Innovative Behavior: Partial Criteria for the Assessment of Executive Performance[1]

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A major difficulty in conducting research on executive performance has been summarized by Thorndike (1961):

> The criterion problem . . . represents the heart of the problem of doing research on executive appraisal. Getting suitable criterion measures for executives is almost uniquely difficult because the diversity of the job and the intangibility of its products makes it almost impossible (1) to get any tangible performance indications of job success, and (2) to get comparable data for different individuals (p. 69-70).

One suggested approach to the criterion problem is to focus upon partial criteria as opposed to a global or unitary criterion -- upon "the assessment . . . of particular facets of executive behavior that are regarded . . . as distinguishable components of executive activities" (Tagiuri, 1961, p. 110). Such an approach divides "the criterion problem" into two components: (1) the assessment of particular behaviors, and (2) determination of the relevance of the selected behaviors to the overall success or value of the executive. The distinction is similar to that made in a decision-theory approach between the "outcome" and "payoff" matrices (Cronbach & Gleser, 1957).

Each component presents questions for empirical research. Obtaining measures of "particular facets of behavior" is not an easy matter, particularly since such measures are almost necessarily based upon the judgment of observers, with attendant problems related to interpersonal perception (Gage & Cronbach, 1955). Once a partial criterion is defined, its "practicality" and its relationship to overall effectiveness both depend upon aspects of the situation in which the study is made (Guetzkow & Forehand, 1961).

These issues provide context for a study of assessments by superiors and peers of innovative behavior in government administrators, designed for use as criteria in a predictor study and as measures for evaluating an educational program. Innovative behavior in executives is defined as a tendency to develop and consider novel solutions to administrative problems, and to evaluate them in terms of criteria broader than conformity to pre-existing practice. The point of view taken here is that the measures obtained are reports of interpersonal perception, and are therefore influenced by the instruments used, by characteristics of the assessors, and by the nature of the organizations in which the assessments were made. Empirical questions relating to each of these influences may be outlined briefly.

Validity of trait measures. If an instrument is "valid" to the extent that it "measures what it is supposed to measure," then questions of validity are clearly applicable to partial criterion measures. Some questions regarding validity of measures of innovative behavior concern "face validity," and are not easily subjected to empirical analysis. Some important questions regarding discriminant and convergent validity, however, need to be investigated (Campbell & Fiske, 1959). Is innovative behavior, as attributed to an executive by a rater, discriminable from other executive traits (e.g. analytic problem solving abilities or policy executing skills), or from general effectiveness? Does one rater's perception of innovative behavior correspond to another rater's perception of that variable, more than to the other rater's perception of other traits? If the measures are to be useful, we would expect two innovation measures as provided by a particular set of raters (e.g. superiors or peers) to be more highly correlated with each other than either of them would be with any other variable. We also would expect the correlation between peers' and superiors' assessments of innovative behavior to be higher than the correlation between an innovation score obtained from one set of raters and other scores obtained from the other set of raters.

Effect of raters' attitudes. It is clear that ratings are influenced by characteristics of the raters as well as by characteristics of the persons rated (Bruner, 1951, Tannenbaum, Weschler & Massarik, 1961, pp. 324-332). With respect to innovative behavior as a partial criterion, a rater characteristic of special relevance is the rater's attitude toward innovative behavior which may be expected to influence both sensitivity to the behavior, and its relation to perceived success. Attitudes of raters may, for example, influence "inter-rater reliability" of ratings. If two raters tend to agree in the values they attach to innovative behavior, they might also be expected to agree in their general evaluations of an individual's performance. Raters' evaluation of innovative behavior should be directly related to raters' attitudes toward innovation. In the present study, we may consider that (a) directly assessed attitude toward innovation and (b) the degree to which persons seen as innovative are also seen as generally effective are separate measures of the same variable. It is predicted that the correlation between innovation scores and global ratings will be higher when raters report that they value innovation highly than when they do not so report.

Effect of perceived organizational climate. "Climate" is another aspect of the "situation" which may determine whether or not a given kind of behavior leads to perceived success. Organizational practices which can be described as "bureaucratic" or rule-centered appear to be those that would discourage innovative behavior on the part of individual administrators (March & Simon, 1958, pp. 36-47), which "democratic" or group-centered practices ought to encourage such behavior. It is predicted, therefore, that the correlations between innovation scores and global ratings will be higher in organizations that subjects describe as democratic than in organizations they describe as bureaucratic.

Procedure

Variables.[3] The variables discussed in this paper are derived from questionnaires by means of which government executives were described by organizational associates. Two groups of raters (superiors and peers) and two methods for describing behavior (rating scales and forced adjective comparisons) were used. The scores examined are described briefly below.

All of the items described as "ratings" consist of brief complimentary statements "which may be descriptive of government executives." The rater responds on a 7-point scale, the alternatives ranging from "perfectly describes the participant" to "could not be accurately applied to the participant." The following 10 items, which were distributed throughout a 60-item questionnaire, constitute the innovation rating cluster (variable 1):

1. Approaches problems with flexibility; able to change assumptions and orientations in order to arrive at workable new decisions.
2. When decisions require inventiveness: Maintains flexibility in developing a wide variety of approaches to a decision.
3. Works creatively to develop new and unusual solutions to the organization's problems.
4. Is quick to recognize when events require decisions to re-evaluate organizational practices and implications.
5. Constantly evaluates his own methods and practices, adapting them to changing conditions when necessary.
6. When a decision cannot repeat past solutions or be modeled after precedent: probes for fresh new orientations before coming to final judgment.

7. When a situation demands innovation: relies upon his own ideas and judgment.
8. Able to free himself from binding considerations in coming to independent judgments.
9. When decisions involve new and unsolved problems: is creative and imaginative in developing new solutions.
10. Able to develop and implement independent, innovative and original judgments.

In the split-half analysis reported below, the ten items were divided randomly into two halves, presented here as items 1-5 and 6-10 respectively (thus, the order presented here is not that in which the items were marked).

The forced choice innovation measure (variable 2) was constructed from a list of five adjectives judged to be descriptive of innovative behavior (self reliant, inquiring, flexible, original, independent) and five adjectives judged to be equally complimentary but unrelated to innovation (stable, industrious, prudent, dependable, cooperative). The 25 "cross list" pairs of adjectives, i.e., pairs containing one adjective from each list (along with 10 "dummy" intra-list pairs) constituted the material presented to the rater. The rater was asked to "select and underline the one adjective from each pair which you think is more descriptive of the participant." The score is the number of times an "innovative" adjective was selected over a "non-innovative" adjective.

The seven rating clusters pertaining to other facets of executive behavior, numbered 3 through 9, are each composed of five rating scale items. Their content and titles are based upon cluster analysis of a previous version of the scales. They are similar in content to similarly-named scales described elsewhere (Forehand & Guetzkow, 1962; Guetzkow, Forehand & James, 1962). Although they may be expected to correlate to varying degrees with innovation ratings, each is conceptually distinguishable from innovation, and ought to be distinguishable empirically.

The global evaluation rating cluster (variable 10) consists of three items:

1. Capable of handling almost any executive-level job successfully.
2. In general, is an extremely competent manager.
3. One of the best administrators I have ever known.

This cluster was included in an attempt to define a separate "halo" or general evaluation measure.

The rater's attitude variable (variable 11) utilized the same adjective pairs as variable 2 (in different order), but raters were instructed to describe "your conception of an ideal government executive," rather than a particular individual. The rater's attitude-toward-innovation score is the number of innovative adjectives chosen, a high score interpreted as indicating a favorable attitude toward innovation.

Perceptions of organizational climate were assessed by means of an adaptation of Nelson's Leadership Practices Survey.[4] The instrument is designed to assess attitudes toward leadership. Fifty administrative problems or situations are described, and the subject selects one of two alternative responses to each of them. The responses are keyed as representing differing orientations toward leadership: bureaucratic or rule-centered, technocratic or work-centered, idiocratic or individual-centered, and democratic or group-centered. In the present study, subjects were asked to indicate the practices which they would consider typical in their organizations, rather than their own preferences; the wording of items and instructions was modified to facilitate such responses. The alternatives are presented in pairs. In the form used here "rule-centered" alternatives are always paired with "group-centered" ones, so that rule-centered and group-centered descriptions are treated as if they were on a continuum. The 25 items involving these two kinds of alternatives were used in the analysis.

Subjects and raters. The subjects whose behavior was described by the raters were 188 persons holding administrative positions in 30 agencies of the United States Government. Their grade levels range from 11 to 17, with a mean of 13.3. Eighty-seven described their positions as "primarily line" and 101 described their positions as "primarily staff" positions. The subjects responded to the organizational perception questionnaire in group sessions during which they also took other tests for use in a later predictor study. Each subject was described by his immediate superior and by a peer (identified as a "co-worker who knows you well and who is neither a superior nor a subordinate") who was nominated by the subject himself. Superior and peer questionnaires were distributed and collected by mail.

Results

Validity of trait measures. The 10 items in the innovation rating cluster (variable 1) were included together in a single scale on the basis of a prior judgment rather than predetermined empirical homogeneity. Their internal consistency should exceed the relationship of that cluster to other variables, if the theoretical convergence in their interpretation is mirrored in empirical convergence when they are used to describe individuals. The uncorrected correlation between the two halves of the innovation rating cluster (variable 1) is .87 for superiors' ratings and .84 for peers' ratings. Correlations between these half-cluster scores and other rating clusters range from .52 to .78 for superiors, and from .25 to .74 for peers. In each case the correlation between the two half-cluster innovation scores is significantly ($P < .05$) greater than all of the correlations between an innovation half-cluster and other clusters.

We may thus conclude that the innovation cluster has homogeneity independent of its relationship with other rated attributes, even though there is evidence of considerable generalized "halo" variance.

Results concerning intra-rater relationships among measures are presented in Table 1. The prediction that an innovation measure would be more highly correlated with another innovation measure than with other variables is not supported with reference to the innovation rating cluster (variable 1). In both superiors' and peers' ratings the correlation between variables 1 and 2 is almost invariably smaller than those between variable 1 and other rating scales, in most cases substantially so. "Partialing" these correlations with respect to the global rating cluster in an attempt to control halo variance, results in a smaller discrepancy between innovation-innovation and innovation-other trait correlations, but the latter are still, in general, substantially higher than the former. The rating cluster scores evidently share "method factor" variance to such an extent that different traits measured by the same method correlate more highly than do different measures of the same trait.

Insert Table 1 about here

The forced-choice innovation measure (variable 2) more closely manifests the expected properties. With both sets of raters, the correlation between variables 1 and 2 significantly exceeds all but one of the seven correlations between variable 2 and measures of attributes other than innovation ($P < .05$). The exception in each case is the "self-confidence" rating cluster. In terms of partial correlations, correcting again for relationships with the global evaluation rating cluster, the only variables that have a non-zero relationship with the forced choice innovation measure are the rating clusters for innovation,

Table 1

Intra-Rater Correlations[a]

		Zero-order Correlations				Partial Correlations[b]			
		Superior		Peer		Superior		Peer	
	Variable	Var 1	Var 2	Var 1	Var 2	Var 1	Var 2	Var 1	Var 2
1.	Innovation rating cluster	(.93)[c]	.44[d]	(.92)[c]	.37[d]	--	.36[d]	--	.32[d]
2.	Innovation forced choice score	.44	--	.37	--	.36	--	.32	--
3.	Self confidence rating cluster	.79	.43	.70	.38	.59	.48	.41	.33
4.	Cautiousness rating cluster	.48	-.18	.31	-.25	.28	-.48	.26	-.31
5.	Discernment rating cluster	.79	.22	.70	.12	.59	.05	.48	-.02
6.	Policy making rating cluster	.80	.25	.73	.22	.60	.01	.50	.10
7.	Policy execution rating cluster	.70	.20	.55	-.02	.45	.04	.26	-.18
8.	Bureaucratic decision making cluster	.77	.20	.72	.12	.54	.05	.55	.00
9.	Analytic decision making rating cluster	.75	.20	.74	.10	.51	.06	.49	-.06
10.	Global rating cluster	.73	.29	.74	.21	--	--	--	--

[a] N = 188, r = .14 significant at .05 level; r = .19 significant at .01 level

[b] Controlling variance attributable to correlation with variable 10

[c] Corrected split-half reliability

[d] Entry repeated from preceding column

self-confidence and (inversely) cautiousness (variables 1, 3, and 4). The low but significant correlations between variables 2 and 10 suggest, further, that innovative behavior, as manifested in forced adjective comparisons, can be perceived relatively independently of general effectiveness, even though it is perceived as positively related to general effectiveness.

Inter-rater (superior vs. peer) reliabilities for both innovation measures are significantly greater than zero, as is shown in Table 2. The inter-rater reliability for the innovation rating cluster numerically exceeds all but one of the 14 cross-variable inter-rater correlations, but significantly exceeds only six of them. The correlation between two sets of responses to the forced choice measure numerically exceeds all of the other cross-rater correlations involving that measure, and significantly exceeds all except one ($P < .05$). The exception: innovation as reported by peers on variable 2 has a correlation of .22 with self-confidence (variable 3) as reported by superiors. The predictions regarding inter-rater relationships are thus supported, in general, for variable 2, but are not supported for variable 1.

Insert Table 2 about here

Effect of raters' attitudes. An analysis of the relationship between degree of agreement between raters on the attitude measure and inter-rater correlations on several assessment scales yielded ambiguous results. A description of the analysis, results and tentative interpretations have been made available elsewhere (see footnote 3).

The effect of raters' attitudes upon evaluation of innovative behavior was examined by comparing the correlation between innovation measures and general effectiveness ratings in (a) the 60 subjects whose superiors had the

Table 2

Inter-Rater Correlations of Innovation Measures

N = 188

	Variable	
	1	2
Inter-rater "reliability" (uncorrected): r_{II}	.22**	.32**
Summary of inter-rater correlations: Innovation measures with variables 3-9		
Median correlation (N = 14)	.18	.08
Highest	.27	.22
Lowest	.02	.01
Number higher than r_{II}	1	0
Number not significantly lower than r_{II}[a]	8	1

a. At the .05 level (one-sided test)

** Significant at .01 level

highest attitude-toward-innovation scores and the 60 whose superiors had the lowest attitude scores, and (b) the 60 subjects whose peers had the highest attitude scores and the 60 whose peers had the lowest attitude scores. The results, as shown in Table 3, indicate that, as predicted, the forced choice innovation score has a significantly higher correlation with the general effectiveness score when raters report a favorable attitude toward innovation

Insert Table 3 about here

as the contract. It will also be noted that the correlation between these two measures when raters favor innovation (.51 and .46 for superiors and peers respectively) are substantially greater than the corresponding values in the total sample (.23) and .21; see Table 1); the significance of these differences was not tested since the smaller samples are subgroups of the larger. Thus rater attitude toward innovation is convergently manifested in direct measurement and in the valuation of individuals perceived to vary in innovative behavior. These relationships are not replicated with respect to the innovation rating cluster. It appears that the latter measure is so highly saturated with generalized rater variance that it is not possible to observe a differential between relationships of this measure to general effectiveness ratings as a function of rater attitude.

Effect of perceived organizational climate. The influence of organizational climate upon evaluation of innovative behavior was studied by examining results separately for the 60 subjects who most often described their organization's practices as "group-centered" and the 60 subjects who most often described their organization's practices as "rule-centered." Table 4 shows that for peer responses and for combined superior and peer responses (sum of

Table 3

Intra-Rater Correlations with the General Effectiveness Rating in Subsamples defined by Raters' Attitudes toward Innovative Behavior

	Superiors		Peers	
Variable	Favorable Attitude N = 60	Unfavorable Attitude N = 60	Favorable Attitude N = 60	Unfavorable Attitude N = 60
1. Innovation: rating cluster	.74	.66	.82	.75
2. Innovation: forced choice	.51	.12**	.46	.02**

**Significantly lower than value in preceeding column ($p < .01$).

standard scores), the forced choice measure (variable 2) is significantly correlated with global ratings in organizations described as "group-centered" but not in organizations described as "rule-centered." The direction is as predicted, but the differences between the correlations in the two samples, however, is not significant. With respect to superiors' ratings, the relationships are reversed. Variable 2, as responded to by superiors, is significantly related to global ratings in the "rule-centered" subsample but not in the "group-centered" subsample. Again, the cross-sample differences are not significant. Correlations of variable 1 with global ratings are numerically but not significantly higher in the "group-centered" than in the "rule-centered" subsamples.

Insert Table 4 about here

Discussion

It is evident, both from the results of the present study and from those of previous studies (Forehand & Guetzkow, 1962, Mayo, 1956, Fiske & Cox, 1960), that lack of discriminant validity of ratings is a serious obstacle to the study of partial criteria. The rating scale measure of innovative behavior employed in this study (and incidentally, those of other traits) can be adjudged unacceptable as an index of a particular, distinguishable facet of behavior, because of inability of raters to differentiate among the behavior patterns as defined. On the other hand, the forced choice measure -- with which observers select from adjective pairs those adjectives which seem most descriptive of a subject -- seems more promising. The correlation between superiors' and peers' responses to the variable is sufficient to indicate that the raters' perceptions of the behavior it describes are to some degree congruent: its major correlates,

Table 4

Intra-Rater Correlations with the General Effectiveness Measure in Subsamples whose Members Described their Organizations as Group Centered (GC) or Rule Centered (RC)[a]

	Superiors' Ratings		Peers' Ratings		Combined Ratings[b]	
Variable	GC	RC	GC	RC	GC	RC
1. Innovation: rating cluster	.70*	.67*	.77*	.63*	.74*	.62*
2. Innovation: forced choice	.12	.27*	.35*	.14	.31*	.19

a. All N's = 60

b. Superiors' + peers' innovation assessment vs. superiors' + peers' general effectiveness assessment

*Significant at the .01 level.

both within and across raters, are other measures of innovation, and ratings of attributes conceptually and theoretically associated with innovativeness; it is not highly related to general effectiveness ratings except when raters indicate by an independent measure that they place a high value on innovative behavior in general. To illustrate the suggested properties of the two measures; if objectively measured correlates of the two scores are studied, we may predict that the variables that would be most closely related to the innovative rating cluster would be those that would be expected to predict general success, e.g., general mental ability, achievement motivation; the variables most closely related to the forced choice innovative score may be interpreted more specifically as attributes related to innovative behavior. The results offer encouragement that further work on forced choice rating methods (e.g., Kay, 1959) might provide discriminable partial criteria, particularly if some attention is given to the comparative social desirability (Edwards, 1959) of the paired descriptions.

Some limitations in the analysis of convergent and discriminant validity in the present study should be noted. First, it is clear from a comparison of Tables 1 and 2 that two raters' assessments of the same trait are not more highly correlated than are two traits as assessed by the same rater, as the Campbell-Fiske criterion would require; the studies of ratings cited above would suggest that such a relationship could not be reasonably expected. It should be noted, however, that measures remain both theoretically interesting and potentially useful when there is evidence that variance ascribable to content exists over and above that attributable to rater bias (Humphreys, 1960). Secondly, while rating cluster responses were compared with similarly defined measures of other traits, only the trait of innovative behavior was assessed by the forced choice method. The omission -- which resulted from failure to anticipate the apparent superiority of the forced choice measure -- would need to be remedied in future studies of the validity of forced choice measures.

Several results suggest interacting relationships between perceived innovative behavior, the attitude and hierarchical perspective of the perceiver, and organizational climate. Perhaps these relationships may be summarized most briefly by stating conditions under which the value assigned to innovative behavior -- and hence the utility of innovative behavior as a partial criterion -- will vary. To an extent it is tautological to state that the general performance of persons perceived as innovative will be evaluated more highly by perceivers who themselves value innovative behavior highly than by those who do not. More pertinent here is evidence that the perceiver's attitude can be meaningfully assessed, and can thus be incorporated into research designs and applied generalizations, as has been previously suggested (Guetzkow & Forehand, 1961). Also noteworthy is the fact that such a relationship was not manifested with respect to the rating scale measure. This indicates that empirical conformity to logical criteria of relationship between specific behaviors and general evaluations is an aspect of the validity of partial criterion measures that may not be neglected.

Results suggest that persons perceived as innovative will be evaluated more highly by peers if the organizational climate is perceived as group-centered or "democratic," while they will be more highly evaluated by superiors if the climate is perceived as rule-centered or "bureaucratic." In interpreting this result, it should be noted that the organizational levels of both assessors and assessees varied in the sample. The observation, if it proves to be replicable, must be attributed to the relationship between assessor and assessee, rather than to their absolute hierarchical positions. Blau and Scott (1962, pp. 116-128), in interpreting experimental studies of communication patterns, developed the hypothesis that a hierarchical relationship among group members (as between superiors and subordinates) facilitates coordination of group members, by restricting the flow of communication, while non-hierarchical relationships (as between peers) facilitates the development of new solutions to problems. Our findings are consistent with this hypothesis. In group-centered environments, peers cooperate in the development of new problem solutions, and a superior is likely to receive for review a group-developed solution. In such a situation, the innovative skills of an individual would be valued by peers for their contribution to the group's task, whereas a superior would not be in a position to observe that contribution. In a rule-centered organization, the contributions of peers are more likely to be individual in nature, leaving the task of coordinating individual contributions to the superior. In this situation an administrator's innovative skills would tend to be irrelevant to the individual goals of his peers, but apparent and useful to the superior in achieving a coordinated group product. This analysis would suggest, as a hypothesis for future research, that innovative behavior would be more readily recognizable, and hence more predictable by cognitive and personality characteristics, when assessed by peers in group-centered climates, and when assessed by superiors in rule-centered climates.

In summary, the factors that influence partial criterion measures of administrative performance are many and complex, particularly when measures take the form of ratings. Two aspects of such measures have been identified as requiring empirical attention: the distinguishability of the facets of performance examined, and the ways in which the facets of behavior are evaluated.

It may be suggested that partial criteria are likely to be "practical" only if such properties of the measures are examined under varied conditions. The results of the present study suggest that at least some relevant conditions are amenable to specification and measurement, although procedures for doing this are in an elementary stage of development. Such studies offer promise of contributing to theoretical understanding of behavior-in-organization, and eventually an opportunity for improving upon what Henry (1961) has called "coefficients of the 'Irish' variety (O'Toole, O'Rourke, O'Seven or .00)," at least under certain identifiable conditions.

Footnotes

1. This study was conducted as part of a Cooperative Research Project No. 975, supported by the U. S. Office of Education. Appreciation is expressed to Harold Guetzkow for many contributions to the study and this paper.
2. Now at Carnegie Institute of Technology, Pittsburgh, Pennsylvania.
3. The following materials have been deposited with the American Documentation Institute: A copy of the questionnaire containing the rating scales, the forced-choice assessment and the raters' attitude measure; a copy of the Organizational Perceptions instrument; and a four page paper reporting several supplementary analyses.
4. Nelson, C., "A Look at Some of the Basic Organizational Forces that Affect Leadership in Management, and May Cause Management Training Courses to Fail" (manuscript, Management Research Associates, 1959).

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II-16

Supplement to:

Assessments of Innovative Behavior: Partial Criteria for the Assessment of Executive Performance

by

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The original paper described analyses of the effect of raters' attitudes upon rater-valuation of assessed innovative behavior. This supplement describes an analysis of the effect of raters' attitudes on inter-rater reliabilities. All variables are defined and assessed as reported in the original paper.

Effect of raters' attitudes. The effect of raters' attitudes on inter-rater agreement was investigated by computing several inter-rater correlations on three subsamples of the 179 subjects whose raters gave sufficiently complete rater-attitude data. The subsamples are: (a) the 60 subjects whose raters agreed most closely (i.e., had smallest absolute score discrepancies) in their attitudes toward innovation (high rater-agreement group); (b) the 60 subjects whose raters agreed least closely (low rater-agreement group); and (c) the 59 subjects intermediate with respect to rater-agreement in attitude (intermediate rater-agreement group).[1] Results regarding variables 1, 2 and 10 are presented in Table A. They were analyzed by making multiple comparisons of values of a given correlation in the three samples, using the "method of adjusted significance levels," suggested by Ryan. Each of the conclusions in Table A is made within an "experimentwise error rate" of .05; that is, a probability not exceeding .05 that "one or more of our conclusions will be incorrect in that we falsely claim significant differences" (Ryan, 1960, p. 319).

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[1] The analysis was originally performed using only the "high" and "low" agreement groups. The intermediate group was analyzed after the curvilinear relation noted below was suggested by examining scatterplots of the relationships in the total sample.

Insert Table A about here

With respect to each of the three variables, we accept the null hypothesis that the inter-rater correlation in the high agreement group equals that in the low-agreement group.[2] A surprising finding is that the inter-rater correlations of the global and innovation rating clusters is lower in the intermediate group than in either of the extreme groups. (The results with respect to variable 1 and variable 10 are not independent; when innovation rating-cluster scores are corrected for their correlations with global ratings, the cross-sample differences are not significant.) It thus appears that rater agreement on general effectiveness has a U-shaped relationship with rater agreement on valuation of innovative behavior in the abstract; raters who agree or strongly disagree in attitudes are more congruent in their evaluations of individual performance than are those for whom neither agreement nor disagreement is pronounced.

It seemed possible that this unexpected relationship arose as a result of the way the groups were defined. The three rater agreement groups were actually heterogeneous in possibly important respects: the high agreement group included pairs of raters both of whose members reported favorable attitudes, and

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[2] The same conclusions are reached if only the two extreme groups are examined in each instance, and the two-sample hypothesis is tested at the .05 level.

Table A

Inter-Rater Reliabilities in Samples Differing in Degree of Rater Agreement in Valuation of Innovative Behavior

Variable	Degree of Agreement High N = 60	 Intermediate N = 59	 Low N = 60	Conclusion from Multiple Comparison[a]
1.	.42	.02	.38	rej. H = I, L = I, acc. H = L
2.	.37	.28	.34	acc. H = I = L
10.	.53	-.05	.34	rej. H = I, L = I, acc. H = L

a. For "acc. H = L," read "accept the null hypothesis that the correlation in sample H equals that in sample L;" for "rej. H = L," read "reject the null hypothesis." All conclusions for a given variable (row) are made without exceeding an "experimentwise error rate" of .05 (see text).

pairs whose members reported unfavorable attitudes toward innovative behavior; the "low agreement" group included pairs in which the superiors' attitude was favorable and peers' attitude unfavorable, and pairs in which the superiors' attitude was unfavorable and the peers' attitude favorable, etc. An additional exploratory analysis was undertaken to learn whether there are relationships among more finely differentiated subgroups that might account for the unexpected results. Each of the subdivided groups had an N of 25; a correlation coefficient of .40 is significant at the .05 level (two-sided test). In the high-rater-agreement group, if one rater has a high attitude score, his partner also tends to have a high attitude score; in the low-rater-agreement group, if one rater has a high score the other tends to have a low score; in the intermediate group, if one rater has a high score, the other rater's score may vary over a wider range than in the other two groups. The subdivided groups and observed correlations are presented in Table B. It will be noted that the highest peer - superior correlations occur when the peers' attitude-toward-innovation scores are low, regardless of the level of the superiors' attitude scores. It is thus suggested that peers who have low attitude-toward-innovation scores are more likely than those who have high scores to parallel the judgments of superiors in assessing the general effectiveness of individuals. If this suggestion is true, the correlation between peers' attitude scores and the absolute discrepancy between peers' and superiors' responses to variable 11 should be positive since a low attitude score is expected to be associated with a small discrepancy. The correlation is .14 (N=188, $P < .05$, one sided test).

Insert Table B about here

Table B

Correlations of Superior and Peer Global Ratings in Subgroups Defined by Attitude-Toward-Innovation Scores[a]

		Peers Attitudes		
		Favorable	Unfavorable	Allowed to vary
Superiors Attitudes	Favorable	.37	.51**	-.06
	Unfavorable	.41*	.65**	-.02
	Allowed to vary	.24	.44*	--

a. All N's = 25

* Significant at .05 level

** Significant at .01 level

Discussion

Peers who describe the "ideal government administrator" in terms of non-innovative adjectives (stable, cooperative, dependable, prudent, industrious) more often than in terms of innovative adjectives (flexible, original, inquiring, independent, self reliant) are more likely to agree with their superiors in global evaluation of a mutual colleague. Two overlapping phenomena may account for this finding. First, peers who do not value innovative behavior highly may be more likely to adopt the hierarchical perspective of superiors, basing criteria for evaluation upon objectives relating to coordination of efforts rather than those relating to individual cooperation. Secondly, peers who do not value innovative behavior highly may be typically more willing to judge behavior in evaluative terms than do those who do value innovative behavior highly.

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Section III

CHARACTERISTICS ASSOCIATED WITH INNOVATIVE BEHAVIOR

Characteristics Related to Innovative Administrative Behavior in Varying Organizational Climates

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Research interest in variables associated with innovative behavior is manifested in psychological studies of creativity (Stein & Heinze, 1960), in sociological studies of invention and social change (Barnett, 1953; Nordskog, 1960; Ogburn, 1950) and in studies of organizational change and adaptation (March & Simon, 1958, pp. 173-199). The operational definitions of the innovation variable itself range considerably in these studies. Two defining characteristics, however, seem to be general: An act or product that is innovative (creative, inventive, adaptive, etc.) is (a) novel and (b) valuable. Hypotheses concerning variation in innovative behavior have focussed upon (a) characteristics of individuals who display or do not display tendencies to behave in innovative ways and (b) environmental conditions conducive to the manifestation of innovative behavior.

Individual characteristics proposed as correlates of innovative behavior may be roughly grouped in two categories: cognitive abilities such as flexibility, ideational fluency, and sensitivity to problems (Guilford, 1959) and personality or stylistic traits such as openness to experience (Rogers, 1954), independence of judgment (Rogers, 1954; Barron, 1955), spontaneity and impulsivity (Maslow, 1959; Barron,1954, 1955), and prejudice or rigidity of thought categories (Murray, 1959).

Analyses of environmental effects on innovative behavior have suggested experimental study of such independent variables as pre-exposure to uncommon responses (Maltzman, Brooks, Bogartz and Summers, 1958) and heterogeneity of personalities in a problem-solving group (Hoffman, 1959; Hoffman & Maier, 1961). Many suggested environmental factors, such as atmospheres of psychological safety and freedom (Rogers, 1954), social expectations about the value of innovation (Lasswell, 1959), and degree of organizational institutionalization of innovation (March and Simon, 1958), are not easily subjected to experimental investigation; they may, however, be susceptible to attack by clinical or field studies.

This paper reports a study of innovative administrative behavior of government executives. Assessments by superiors and peers of innovative behavior are based upon a definition of the term "innovative administrative behavior" as a tendency to develop and consider novel solutions to administrative problems, and to evaluate them in terms of criteria other than (but not necessarily exclusive of) conformity to pre-existing practice. Variables whose relationship to such behavior is studied include measures of intellectual aptitudes and personality traits, and categorizations of the subjects' "organizational climates," as perceived by the subjects themselves. Since previous studies suggested systematic "perspective" differences between assessments made by superiors and peers (Forehand, in press), the relationship of the assessor to the assessee was treated as an additional variable for analysis.

Procedures

Variables

Assessments of innovative behavior. Each participant was described by his immediate superior and by a peer. The peer was nominated by the subject himself and was defined as "a person who knows you well, but is neither your superior nor your subordinate."

Assessors were instructed to describe subjects by selecting from pairs of adjectives the one adjective "you think is more characteristic of the participant." The 25 adjective pairs were constructed from two sets of five adjectives each. One set (original, flexible, inquiring, self reliant, independent) was intended to describe behavior characteristics associated with innovativeness; the other set (cooperative, prudent, reliable, industrious, stable) was intended to describe behavior characteristics that are equally desirable, but not associated with innovativeness. The 25 stimulus pairs had one adjective from each set. (An additional 10 pairs of "intra-list" adjectives were included but not scored.) A number of empirical properties of this measure are reported elsewhere (Forehand, in press). Among the properties presently relevant are: (a) the measure is relatively independent of ratings of other characteristics of executives (e.g., analytic decision-making ability, self confidence); (b) it is not highly correlated with global effectiveness ratings except when assessors report, by an independent measure, that they value innovative behavior highly; and (c) correlations between peer and superior assessments for the same subject are relatively higher than those obtained with 7-point rating scales with similar content.

Predictor variables. The intellectual characteristics of the participants were described in two ways -- globally through a general test of intellectual ability, and more specifically through factored tests of creativity. General mental ability was assessed by means of the Thurstone Test of Mental Alertness (TMA) (Science Research Associates, 1952).

Six cognitive ability factors that have been identified in factorial studies of creativity (Guilford, 1959; Guilford & Merrifield, 1960) were selected for the study; each factor is measured by a composite of two or three tests. The factors, their interpretation and tests defining them in the present study are briefly outlined below. The tests are described by Guilford and Merrifield (1960) and by Guilford, *et al* (1954).

1. Sensitivity to problems; ability to see deficiencies in a plan, product or practice. Tests: (a) Seeing Deficiencies, (b) Apparatus, (c) Social Institutions.
2. Ideational fluency: ability to generate uncritically many ideas in response to a given stimulus. Tests: (a) Plot Titles (not-clever responses), (b) Consequences ("obvious" responses), (c) Ideational Fluency Test.
3. Penetration: ability to penetrate below the immediate and obvious. Tests: (a) Similarities, (b) Social Institutions.
4. Spontaneous flexibility: ability to change set regarding meaning of

a concept quickly. Tests: (a) Brick Uses, (b) Alternate Uses.

5. Semantic redefinition: ability to redefine concepts to meet specified conditions. Tests: (a) Gestalt Transformation, (b) Object Synthesis, (c) Picture Gestalt.
6. Originality: ability to produce unusual or unexpected responses. Tests: (a) Plot Titles (clever titles), (b) Consequences (remote responses).

An individual's score on factors in the present study is the sum of his standard scores on the tests defining that factor.

Personality variables were measured by the scales of the Edwards Personal Preference Schedule (EPPS) (Edwards, 1959), the Dominance, Self Acceptance and Self Control scales of the California Psychological Inventory (CPI) (Gough, 1956), and Rokeach's Dogmatism Scale (Rokeach, 1960).

Organizational Perceptions. The subjects' perceptions of organizational climate were assessed by means of an adaptation of Nelson's Leadership Practices Survey. The instrument is designed to assess attitudes toward leadership. Fifty administrative problems or situations are described, and the subject selects one of two alternative responses to each of them. The responses are keyed as representing different orientations toward leadership: bureaucratic or rule-centered, technocratic or work-centered, idiocratic or individual-centered, and democratic or group-centered. In the present study, subjects were asked to indicate the practices they would consider typical in their organizations, rather than their own preferences; the wording of items was modified to facilitate such responses. The responses are presented in pairs. In the form used here, "rule-centered" alternatives are always paired with "group-centered" ones, so that rule-centered and group-centered descriptions are arbitrarily treated as if they were on a continuum. The 25 items involving these two kinds of alternatives were used in the analysis to constitute an Organizational Perception Questionnaire.

Subjects.

The subjects were 198 persons holding administrative positions in 30 agencies of the United States government. Their grade levels range from 11 to 17, with a mean of 13.3. About half of the executives were from headquarters of agencies located in Washington, D. C. The other half of the executives were associated with regional offices of agencies located in the Chicago metropolitan area. The testing consumed an entire day, for which each executive took a day's leave. The subjects were given an honorarium for their participation, approximately commensurate to their day's salary. Ninety-five subjects described their positions as "primarily line," and 103 described their positions as "primarily staff."

Analysis.

The product moment correlations of each of the predictor variables with superiors' assessments of innovative behavior and with peers' assessments were computed for the total sample of 198 subjects and for two subsamples: (a) the 60 subjects who most often described their organizations as "group-centered" and (b) the 60 subjects who most often described their organizations as "rule-centered."

Results

The correlations of predictor variables with peers' and superiors' assessments in the total sample and each of the two subsamples are presented in Table 1. It will be noted that peers' assessments are somewhat more "predictable" by our predictor variables than are superiors' assessments in the total sample and in the group-centered sample. Assessments by superiors are more predictable than those by peers in the rule-centered sample. There are also differences in the patterns of variables related to assessments by different raters for the different samples.

Insert Table 1 about here

Table 1

Correlations with Assessments of Innovative Behavior

	Superiors' Assessments			Peers' Assessments		
Sample:	Grp Cent. (N=60)	Rule Cent. (N=60)	Total (N=198)	Grp Cent. (N=60)	Rule Cent. (N=60)	Total (N=198)
Cognitive Factors						
1. Sensitivity to Prob.	.20	.05	.06	.36**	.01	.15*
2. Ideational Fluency	.27*	-.17	.03	.31*	-.15	.06
3. Penetration	.31*	.02	.13	.26*	-.03	.18**
4. Spontaneous flex.	.14	-.08	.01	.26*	-.05	.10
5. Semantic redef.	-.16	.18	.05	.31*	.02	.10
6. Originality	.05	.29*	.10	.23	.18	.16*
EPPS ("manifest needs")						
7. Achievement	.04	.12	.07	.20	-.14	.08
8. Deference	-.04	-.20	-.10	-.36**	-.08	-.12
9. Order	-.21	-.18	-.15*	-.35**	-.03	-.17*
10. Exhibition	-.19	.19	.01	.11	-.09	-.03
11. Autonomy	.17	-.03	.06	.18	.16	.15*
12. Affiliation	.07	-.18	-.11	.02	-.11	-.07
13. Intraception	.05	-.06	.07	.18	-.35**	-.04
14. Succorance	-.07	-.06	-.13	-.04	.03	-.07
15. Dominance	-.14	.05	.03	.08	.03	.12
16. Abasement	-.04	-.24	-.05	-.11	-.01	-.03
17. Nurturance	.25*	-.28*	-.04	.05	.00	.04
18. Change	-.12	.18	.08	.12	.17	.07
19. Endurance	-.25*	.00	-.05	-.27*	-.02	-.08
20. Heterosexuality	.12	.25*	.08	.19	.05	.05
21. Aggression	.14	.41**	.20**	.02	.27*	.10
22. Consistency Score	.17	.34**	.18**	.06	-.14	.00

Table 1 Continued

	Superiors' Assessments			Peers' Assessments		
Sample:	Grp Cent.	Rule Cent.	Total	Grp Cent.	Rule Cent.	Total
Calif. Psych. Inv. Scales						
23. Dominance	-.08	.41**	.13	.22	.13	.10
24. Self control	-.08	-.10	-.12	.08	-.03	-.03
25. Self acceptance	-.11	.19	.10	.17	-.10	-.03
Rokeach Dogmatism Scale						
26.	-.07	-.01	-.03	-.22	.16	-.03
Test of Mental Alertness						
27. L Score	.12	.24	.10	.43**	-.05	.15*
28. Q Score	-.05	.33**	.07	.36**	.00	.17*
29. Total Score	.06	.29*	.10	.45**	-.03	.18**

*Significant at .05 level. **Significant at .01 level. (two tailed tests)

Peer assessments, in the total sample, are significantly correlated with general mental ability and with three of the six creative aptitude variables. Only two of the twenty measures of personality -- need for autonomy and (negatively) need for order -- were correlated with peer assessments in the total sample. In the subsample of persons describing themselves to be in group-centered organizations, the intellectual factors predominate as predictors; with the global ability measures and with five of the six creative cognitive factors being significantly related to assessments of innovative behavior made by peers. For this subsample of individuals three of the personality measures were related to peer assessments, all in a negative way: needs for deference, order and endurance ("keeping at [illegible] until it is finished;" Edwards, 1956, p. 11). In the subsample of persons describing themselves to be in rule-centered organizations, neither general ability nor any of the creative cognitive factors are related to peer assessments. Only two variables are significantly related to assessments in this subgroup: lack of need for intraception ("to analyze one's motives and feelings;" Edwards, 1956, p. 11) and need for aggression.

Relations between the predictor variables and the assessments made by superiors present many contrasts. In the total sample, superiors' assessments are related to need for aggression, consistency and lack of need for order. In rule-centered organizations, general mental ability is a significant predictor (note the contrast with peers' assessments), as is originality and consistency; other significant relationships in the rule-centered group appear to focus around interpersonal styles of behavior: need for aggression, dominance, heterosexuality and lack of need for nurturance. In group-centered organizations, two creative aptitudes, ideational fluency and penetration, are related, as are need for nurturance and lack of need for endurance (task completion).

Discussion

A more explicit description of the difference between "group-centered" and "rule-centered" samples in the foregoing analysis will facilitate further discussion. A few examples of content of items from the Organizational Perception Questionnaire may suffice.

Organizational Problem Area:	Rule-Centered Solution:	Group-Centered Solution:
Promotion to supervisory position	Concentrate on understanding of and respect for official policies	Concentrate on standing among employees as a leader
Maintaining discipline	Treat all employees alike, according to established rules	Helps employees work out a common standard of action based on rules
Training a new employee	Give a complete set of written instructions to study	Explain job requirements and allow him to develop own methods, within limits of requirements
Informal relationships between superiors and subordinates	Avoided, in order to maintain impartiality	Accepted as any other friendship
Coordination among parts of the organization	Clear cut delegation of responsibility; no overlap of authority	Supervisory planning sessions during which unit supervisors work out solutions to conflicts

The subjects in the "rule-centered" organizations are those who most often said that their organizations would typically adopt the rule-centered solution in 25 situations like these; the "group-centered" subsample was defined analogously.

The results clearly indicate that whether or not an individual with a given configuration of aptitudes and traits, is described as innovative (i.e., as being original, flexible, inquiring, self-reliant and independent as opposed to prudent, industrious, reliable, stable and cooperative) depends upon the perceived nature of the organization in which he works, and upon his organizational relationship to the assessor. There were no predictor characteristics which held across both assessors and situations, with the possible exception of a lack of need for order (although even in this instance, executives in group-centered organizations without need for order failed to be assessed as innovative by their peers).

There seems to be some patterning of the way in which the predictors of intellectual aptitude are differentially related within the subsamples. The measure of general mental ability is significantly related to peers' assessment only in the group-centered sample and, in striking contrast, to superiors' judgments only in the rule-centered sample. The creative aptitudes loom important when assessments are made by peers in group-centered organizations. They are considerably less relevant to superiors' assessment in both group- and rule-centered climates, and are not related at all to peers' assessment in rule-centered organizations.

Again, there seems to be patterning in the way in which different kinds of personality predictors are related to assessment of innovation in the subsamples of our government executives. n order, n endurance, and n deference show a pattern similar to the one exhibited by the aptitude measures: they are most relevant to peer group-centered assessments, less so in the peer rule-centered and superior rule-centered groups, and hardly at all in the superior group-centered sample. Those personality traits, on the other hand, which relate to interpersonal behaviors (n dominance, n aggression, n nurturance, and n heterosexuality) and consistency, tend to be more relevant to superiors' assessments in rule-centered organizations than to assessments in any other subsample.

A hypothesis about the nature of the relationships among peers and between superiors and subordinates in samples as defined here provides a rationale to account for these patterns of findings. Blau and Scott (1962, pp. 116-128), after examining a number of small-group communication experiments, suggest that a hierarchical organization of group members (i.e. one in which communication patterns are circuited through a designated member or members) facilitates coordination of responses, by restricting the flow of communication. Non-hierarchical organization, on the other hand tends to facilitate the development of new ideas. This hypothesis may be applied to the present study if, as seems reasonable, rule-centered and group-centered organizations may be described as relatively hierarchical and non-hierarchical, respectively.

Such a characterization would be consistent with the overall finding that peers are more sensitive to test-measured characteristics of their co-workers in group-centered organizations, while superiors are more sensitive to characteristics of their subordinates in rule-centered organizations. In organizations that typically adopt "group-centered" alternatives to problems posed in the organizational perception questionnaire, many decisions would be delegated to groups, and there would be expectations of productivity from these groups. Individual co-workers in such a situation might be expected to be sensitive to the contributions of individual group members, while superiors, receiving a group-made decision, would have less opportunity to observe individual contributions. In the rule-centered situation, on the other hand, peers would tend to work independently of one another, while the superior, with the task of coordinating the work of a number of individuals, would have closer contact with his subordinates, and would be more sensitive to their characteristics.

This hypothesis would also be consistent with the observed differences in patterns of relationship. Peers working together in a non-hierarchical structure would have more opportunity to observe the processes by which an individual arrives at decision than would either peers or superiors in a hierarchical relationship to the individual. These peers, therefore, might be expected to be more sensitive to the creative aptitudes of their co-workers. A superior, on the other hand, is most likely to observe his subordinates in a formal, reporting relationship, particularly in a rule-centered environment. The superior in such a situation is more likely to see the product of his subordinates' work, rather than the processes by which the product was accomplished. The subordinate in such a situation is likely, moreover, to be more or less self-consciously making a "presentation of self," in Goffman's (1959) terms. The superior, in evaluating a subordinate's work and attempting to coordinate it with the work of other subordinates, is thus likely to be sensitive to interpersonal facets of behavior rather than to cognitive aptitudes. The subordinate who appears to be innovative is one who is dominant and aggressive in presenting his ideas and getting them adopted.

At the beginning of this paper, personal characteristics hypothetically associated with innovative behavior were classified into intellectual aptitudes and personality traits. This subdivision was reflected both in the predictor variables of this study and in the innovative behavior assessment device, which contained adjectives relating to cognitive characteristics (original, flexible) and personality characteristics (self-reliant, independent). The results of this study suggest that, with some refinements, these kinds of characteristics might be made a part of a meaningful definition of the tendency toward innovative behavior. Such a tendency perhaps may be defined as having two components: a cognitive component, embracing skills and aptitudes of thinking that permit the development of novel ideas, and an interpersonal component, embracing styles of social interaction that facilitate the adoption of these ideas. The relative importance assigned these components in co-workers' assessments of innovative behavior depend upon the organizational relationship of the assessor to the assessee and the organizational climate. A superior assessing a subordinate's performance may be expected to emphasize the interpersonal component, particularly in rule-centered organizations; a peer assessing a co-worker may be expected to emphasize the cognitive component, particularly in group-centered organizations.

Future research on innovative behavior in organizations might profitably focus upon assessment of these components separately. Useful investigations in this line would include (a) tests of the hypotheses stated above concerning assessments as a function of assessor-assessee relationship and organizational climate and (b) comparison of individuals who are identified as being high on both components, high on the cognitive and low on the interpersonal component, high on interpersonal and low on cognitive, and low on both.

A methodological implication of the findings of this study, taken together with our comparison of forced-choice vs rating procedures (Forehand, in press), is that subjective assessments of innovative behavior are highly sensitive to situational influences. In order to sort out the effect of situational variation on innovative behavior _per se_, as distinguished from its effect on the attitudes and sets of the assessors, there is a need for assessments of innovative behavior anchored in more objective measurement. Because innovative behavior is relative visible -- being unusual by definition -- such an undertaking would not seem impossible. The present study may be considered a preliminary mapping of the predictor domain related to innovative behavior of administrators, an approach that we have previously advocated as an early segment in a sequential program of research in executive performance (Guetzkow & Forehand, 1961). An appropriate next step would be to test the validity of the conclusions of this paper against more objectively defined indices of innovative behavior.

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Section IV

EDUCATIONAL APPROACHES TO INNOVATIVE BEHAVIOR

ERRATA

Section IV

Page 8, line 7: These words should either actually be printed in the colors to be indicated or else footnoted to indicate that the capitalized words were printed in the color indicated here in the parentheses following the word:

RED(blue) BLUE(green) YELLOW(red) RED(green) RED(red), etc.

Page 19, line 10 from bottom, section entitled: PROGRESSIVE CONCEPT REFINEMENT. This section should be footnoted to indicate that it is based on a free adaptation of a device reported in Bruner, J. S. and Oliver, R. R., "The development of equivalence transformation in children," Harvard University, Mimeo.

AN EXPERIMENTAL CURRICULUM FOR STUDIES IN ADMINISTRATIVE INNOVATION

by

Bernard J. James and William L. Libby, Jr.
The University of Chicago

It is a cliche, but a profoundly significant one, to say that organizations, whether private, public, rational, or traditional, survive to the extent that they are able to adapt to their environmental challenges. In such a simple statement lie all the complexities of a theory of institutional change and adaptation. Implied too is a theory of individual learning and adaptation. It is this latter problem that we are most interested in here, for the reason that people who come to us as participants in executive studies come as single administrators drawn from the broad terrain of organizational life.

The program which we have conducted here in administrative innovation is comprised of two special classes of fifteen hours each. In one 15-hour series of meetings, three-hour sessions, we emphasized the cognitive skills involved in innovative behavior. This course emphasized repetition and practice. The other course was built around personality and insight related to the processes of innovation. We did not emphasize repetition and practice, but placed emphasis on the development of basic insight into the processes of innovation. Each special unit is described in detail below.

We define creative behavior as behavior which is new rather than precedent-bound. Creative behavior , by definition, is behavior which to some degree deviates from a norm or modal pattern. One aspect of creative behavior, therefore, is simply its relationship to a general pattern or frequency of similar acts. This can be called the factual, or descriptive, aspect of innovative action. The other aspect of the innovative act is the valuation of the act. The act is judged by the individual or reference group. We call this aspect of the problem the evaluative aspect. Related to the evaluative aspect are judgments about the value of the act over time, a dimension that obviously varies a great deal. Some creative acts are judged socially valuable immediately; in other cases there may be considerable lag in social acceptance of the initial creative act.

We refer to the creative process expressed in an organizational context as "innovation" in order to contrast it with creative behavior of single solitary persons, e.g., an artistic recluse. An evaluative factor, of course, is inherent in all creative acts and is, inevitably, social to some degree. Creative acts are never, permanently, simply odd, bizarre, or idiosyncratic.

The creative process involves, basically, phasic alternation between (1) Opening (idea generation), in which the mind is receptive and searching for novel ideas, and (2) Closing (idea selection), in which the mind strives to inspect and evaluate the novel ideas, either retaining them for further elaboration or tentatively rejecting them. The phases are interdependent; one cannot occur without the other.

The Time Sequence

Viewed as a problem-solving sequence over time, phases alternate through the following stages:[1]

1. Initial sensing of a problem, requiring an interest in, and critical attitude toward, some aspect of one's environment.
2. Problem definition. This entails development of general criteria for accepting or rejecting solutions.

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[1] Note that any stage, or combination of stages, may be carried out by different individuals or groups of individuals. With the Gordon technique a single group carries the whole process well into stage four, while brainstorming confines a single group to stage three alone. The notion of dividing the process among individuals or groups has not been given adequate research attention by social scientists. See W. J. J. Gordon, "Operational Approach to Creativity," *Harvard Business Review*, November-December 1956, p. 41.

3. Solution searching, usually involving nonconscious "incubation" or intuition.

4. Solution development, involving conscious elaboration of possible solutions with the help of critical judgment.

5. Final solution selection. Generally one solution must be at least tentatively adopted for testing, though often there is little or no chance for testing.

6. Convincing others of the merit of the solution, i.e., "selling the solution".

7. Solution implementation or application.[2]

Analog to Simple Perception and Learning

Viewed in greater detail, the creative process may be compared to the perceptual processes which underlie it. Simply put, the human being is continually faced with an environment which is a potential source of information, which he receives through his senses, mainly those of seeing and hearing. He perceives some information immediately, namely that to which he directs his conscious attention, and relates it automatically to knowledge he has already acquired. Other information may be simply perceived and remembered, not readily "understood"; in fact, a person need not even be conscious of it. To understand it he has to restructure his mind, learn, grow to a new level of insight. Much of this process is likely to proceed below the level of conscious awareness; the final consciousness of a meaningful pattern may appear abruptly as a flash of insight. Moreover, it may involve many trials, use of innacurate or incomplete "data", and extended conscious scrutiny, before insight is achieved.

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[2] The problem-solving sequence is often accredited to John Dewey, *How We Think* (Boston: Heath, 1910) and to C. S. Pierce's papers *How to Make Our Ideas Clear* and *The Fixation of Belief*. The "selling" view of implementation seems first to appear formally in S. Boutourline, Jr., *et al.*, *Individual Creativity and the Corporation*, Harvard Graduate School of Business Administration, Mfg. Group 25, Class of 1958 and Institute of Contemporary Art, 1959.

Note also that the development of criteria for criticism and evaluation is properly the domain of such fields as the economics of innovation, law, market assessment, logic, ethics, aesthetics, etc. Selling belongs to courses in salesmanship, to the extent it formally can be taught. Application-production involves technical know-how. We could not pretend to treat such subjects in our course and mentioned them only to emphasize that judgmental criteria may themselves be proper subjects for creative thought, that the creative person may not be very good at selling his ideas, and that the lack of technical knowledge should not necessarily preclude involvement of the originator of an idea in the practical task of applying it. These latter considerations, of course, involve the utilization by an executive of the creative talents of others, rather than development of his own talent.

Metaphoric Transition: A General Approach to Innovative Training

Clearly a number of thinking and motivational sub-processes supplement the innovative process we have described. However, there are two outstanding themes which characterize our process. One is phasic or flexible rather than rigid or fixed behavior, the frequent transition between one perspective and another. The other is the frequency, especially during idea generation phases, of what we may call metaphoric thinking -- reasoning by analogy or simile. For example, a saber-toothed tiger is a paycheck (it represents the "reward" for a caveman's day's labor). Metaphoric thinking appears to characterize both the conscious and the nonconscious thinking processes in creative thought. Moreover, its use requires flexibility in changing perspectives, and it lends itself to tracing the analogies between concrete objects and abstract concepts -- between simple pictorial representations and complex social concepts which exist solely in the minds of groups of people.

This latter point is especially interesting because the intuitional, nonconscious processes which play a large role in creativity seem to manipulate abstract complex ideas by representing them with concrete pictorial representations. Our courses exploit the notions of metaphoric thinking and transition to and from complex abstract social symbols and concrete pictorial representations; in particular they exploit the analogy between simple perceptual processes and their counterparts in more complex creative thinking.

It will be noticed that, from the standpoint of innovative behavior in organization, special classes in innovation, especially of the cognitive type which we identified above, can aim at developing in top administration a sympathy and understanding of the creative individual and the innovative processes even though the individual who is actually in study is not himself particularly creative or innovative. Two goals, then can be distinguished. One involves increasing creativity or innovative behavior in given individuals; the other attempts to increase the awareness or appreciation of creativity and innovation as a resource.

A Cognitive Skills Training Approach

Our cognitive skills training course of fifteen hours was based upon the postulate that creativity is a complex of cognitive skills and that innovative behavior can be maximized by providing the participant with opportunity for the practice of such skills. The approach draws particularly on the work of J. P. Guilford, Frank Barron, J. S. Bruner, and other psychologists concerned with the thinking processes. (See bibliography at end of paper.)

The central concepts of this seminar can be reduced to three aspects of the problem-solving sequence: (1) primary Gestalt formation or field articulation -- that is, initial sensory estimates of the situation at hand; (2) field exploration in which judgment is suspended[3] while ideational fluency and flexibility (divergent rather than convergent thinking) are used to form a variety of tentative solutions; and (3) the processes of closure in which judgment is made as to which tentative solution is more appropriate. Among other concepts treated are "cognitive embeddedness," "set," categorization, and recategorization.

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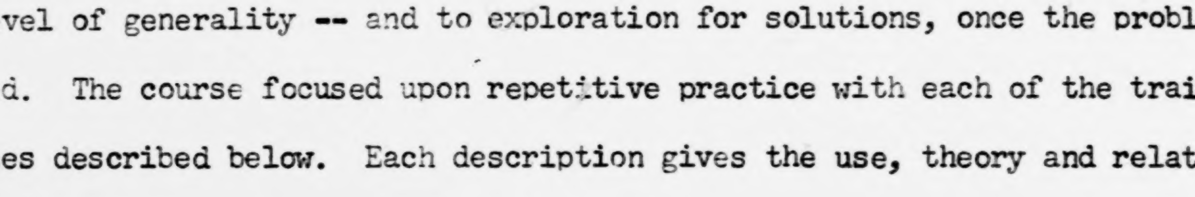
[3] The principle of suspended judgment is, of course, essential to the so-called "brainstorming" method.

In this course the "open" or idea generation phase of the creative process was divided into two thinking sub-processes, each of which could be illustrated and practiced on a simple perceptual level, then generalized through metaphoric reasoning to more complex problem-solving: (1) independent analytic thinking, the tendency to see patterns of meaning within larger ones in an environment which obscures or distracts the attention from the smaller patterns; and (2) fluent-flexible thinking, the tendency to hold off judgment while generating a large number of different alternative solutions to a problem before making a decision. The first of these processes refers particularly to the initial sensing or perceiving of a problem or a solution; the second refers both to the development of the definition of a problem -- awareness of its many aspects at a proper level of generality -- and to exploration for solutions, once the problem is defined. The course focused upon repetitive practice with each of the training devices described below. Each description gives the use, theory and relation of the device to problem-solving or decision-making.

Simple Perceptual Devices

A number of simple perceptual devices provide in concrete pictorial representation the essential aspects of innovative thought.

STICKS: The basic notion that a meaningful pattern is distinct from its elements was demonstrated by giving participants six colored plastic sticks of equal length. Participants were asked to form first one and only one triangle, then two, three, four, five, six, seven, and eight. Hints were given, such as, "The ends of the sticks may stick out," or, "You are not confined to a two-dimensional surface." Figure 1 below illustrates several such solutions:



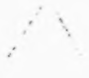
One triangle   Three triangles   Eight triangles

FIGURE 1

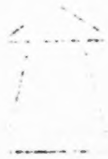
This simple device illustrates two points: (1) any meaningful pattern is formed from a set of elements -- here artificially limited to six sticks -- and the possible patterns are limited only by the range of elements; and (2) given a set of elements, the number of meaningful patterns that can be generated is larger than immediately evident.

The analogy to administrative innovation is direct. Solutions to a problem depend upon the range of information from which we seek a solution. Given a set of information, the kind of problem solution we get depends upon our capacity to continue to put it together in meaningful patters. We can break them up and rearrange them until a number of alternatives from which to pick a solution is available. Effectiveness of this simple device depends upon the ability of the instructor to help the participant trace the analogies to administrative tasks.

EMBEDDED FIGURES: Independent analytic thinking is illustrated in a pure conceptual form by simple embedded figure exercises. Here the problem is to identify a simple meaningful pattern hidden in a larger, more complex one, e.g.:



No



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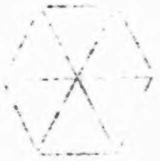
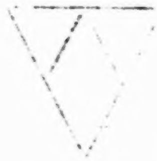


Yes



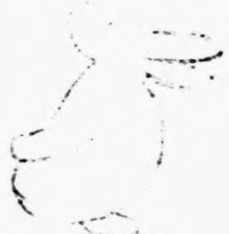
Yes

Our participants were given a series of such exercises to practice.

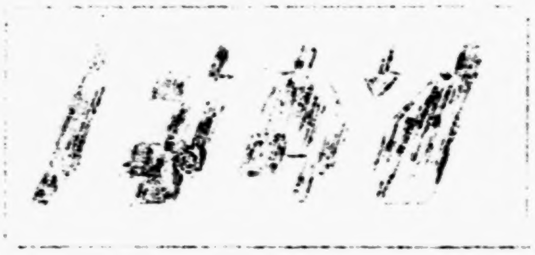
Again the analogy to innovative thinking is direct. Initial awareness of a problem or a solution is due to the fact that a meaningful pattern or relationship exists in the administrator's mind and is noticed when he is confronted with a complex mass of data. The same data, to a less innovative executive, may appear to be either a bewildering jumble of isolated facts or a global pattern in which this essential data does not stick out.

REVERSIBLE FIGURES: Flexibility and independent analytic thinking were practiced together in figures of the following kind:

Neckar Cube



Hare-Goose



The practical analogy is, of course, to the readiness to abandon one perspective and adopt another -- to change back and forth, seeing things now one way, now another. Many administrators have difficulty doing this, both on a simple visual level and in their thinking on the job.

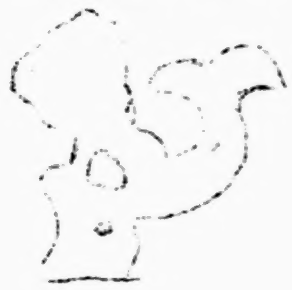
COLOR-WORD SLIDES: Information may be presented in a context of distracting cues or noise. The problem becomes one of paying attention to the particular cue which is meaningful to us. Color word slides were used by us to put over this point forcefully. We projected momentarily on a screen, one at a time in random order, the names of colors, written usually in different colors, as:

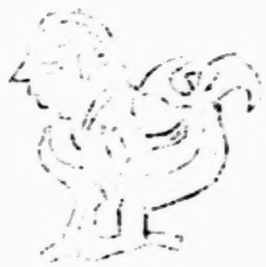
RED BLUE YELLOW RED RED

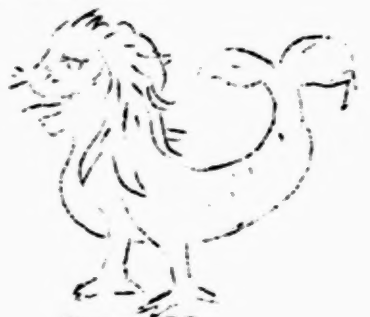
At the same time the instructor called out the name of a color, often still a different one. The participant was to write down either the word, ignoring the color in which it was written and the word which was called out, or he was to write the name of the color in which the word appeared, ignoring the meaning of the word and the auditory cues. The task can be rough. Yet its analogies to the administrator's thinking requirements are obvious.

IMAGINATION STIMULATION: The solution to the kind of problem requiring a truly creative solution is unexpected and often outside our normal experience. For practice in stretching the imagination to include the unanticipated in solving a problem we prepared sets of slides based on pictures of fantasy creatures taken from an old book on heraldry. Each picture was photographed far out of focus,[4] then at each of ten successive intervals as it was brought back into clear focus. Thus, four ordered excerpts from one series appear as follows:

Frame 1


Frame 5


Frame 8


Frame 10

At each stage in the series participants wrote down their choices as to what the object might be. At first what they saw was equivalent to an ink-blot. As it gradually took on a well defined shape it simultaneously became harder, rather than easier, to interpret, and people persisted in trying to preserve some more usual meaningful pattern. The exercise required fluent-flexible, as well as independent analytic, thinking. The administration analogy to the seven-headed hydra and the mermaid is not so easily recognized. Yet if we put ourselves in the shoes of the carriage maker of 1910 who shut his eyes to the merits of the automobile, or the centralized firm which could not see decentralization and thus went bankrupt -- to cite obvious examples -- we see that training to admit the far-fetched, remote solution is an essential ingredient of a course in administrative innovation.

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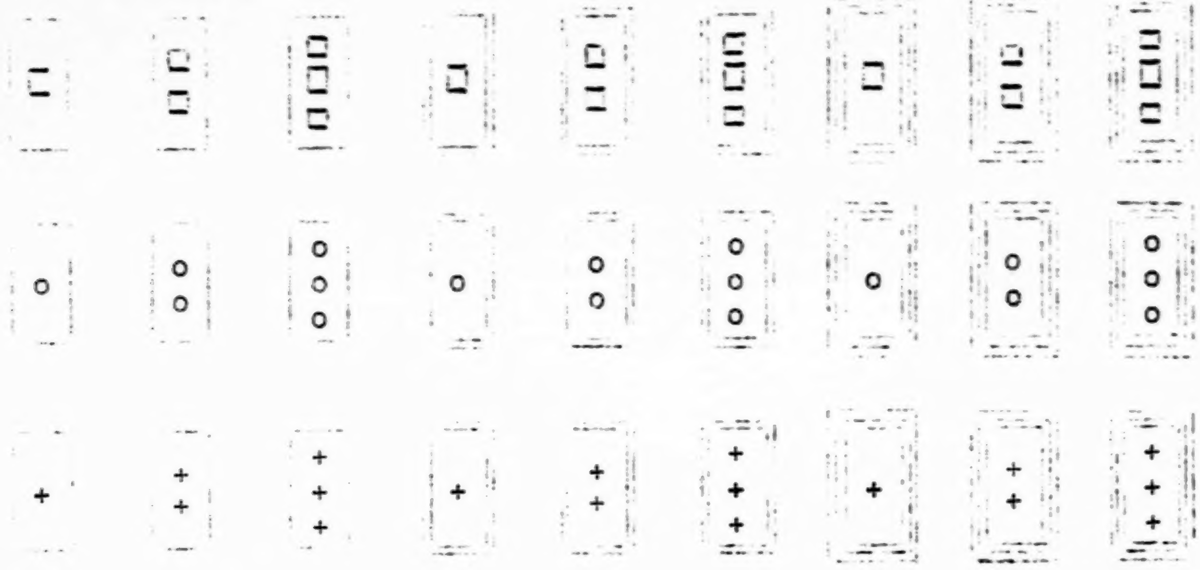
[4] We are grateful to Dr. Van Bortle of the research department of McCann-Erickson, Inc. for suggesting the principle of unfocused photographs.

CONCEPT-FORMATION CARDS: Thinking is aided by the notion of dimensions (or attributes) and degrees of variance along a dimension. For example, one dimension may be color; some of its degrees of variance are red, blue, and black. Another may be shape, for which certain degrees of variance are circle, cross, and square. For this exercies each participant was given a page containing pictures of cards based on four dimensions: shape and color of figures, number of figures, and number of borders.



Participants were taught to identify dimensions and their degrees of variance in forming categories for classifying the cards. They practiced fluent-flexible thinking in forming categories or "concepts."[5]

IMAGINATIVE GENERATION OF MEANINGFUL PATTERNS[6]: In principle this exercise is similar to the imagination stimulation exercise, but it was designed to develop skills in independent analytic thinking through application of fluent-flexible thinking. Four line drawings of everyday scenes -- several drawn from an administrative context -- were successively distorted by obliterating lines. Each set of drawings was arranged from relative obliteration to complete restoration of information content. There was space under each incomplete drawing for the participant to sketch his ideas of the completed picture. During the stages of restoration the cues multiplied to complex proportions. Figure 2 illustrates this exercise.

The notion of putting together isolated bits of information to form a meaningful picture of a situation -- attempting to do so in many alternative ways until a clear picture emerges -- is, of course, precisely what the administrator must do in making important non-routine decisions.

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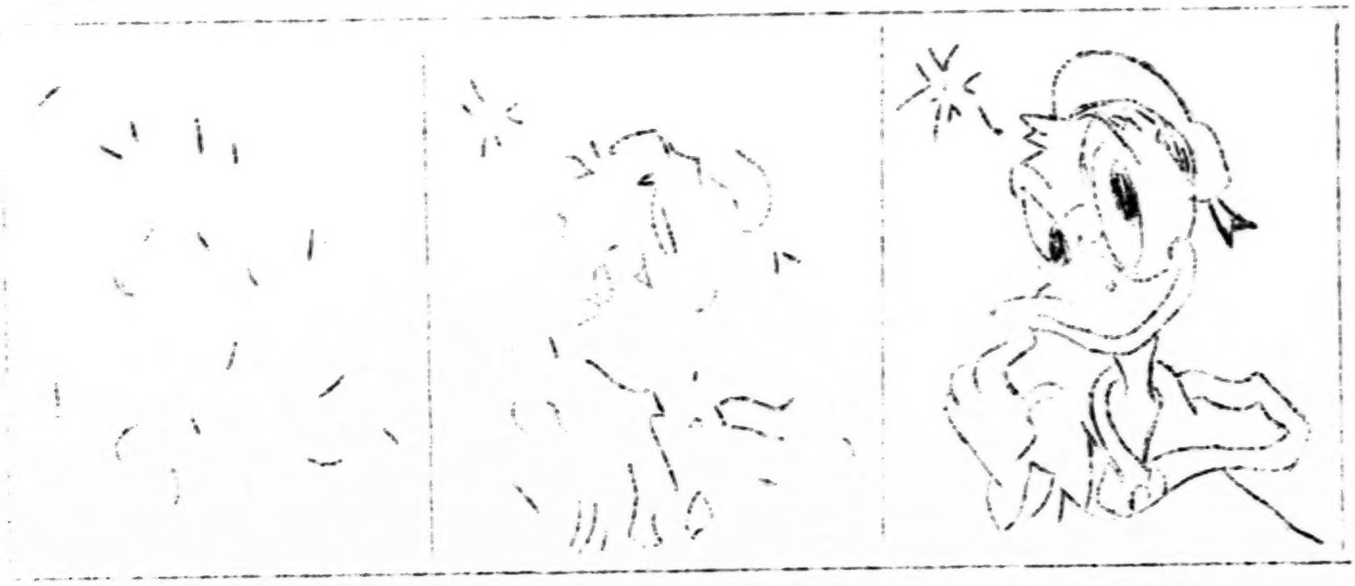
[5] The social scientist will notice that we did not begin to exploit the potentialities of these cards in thinking process exercises. Time limitations precluded fuller use of them.

[6] The notion of successive restoration of distorted line drawings is due to Friedrich Sander, "Experimentelle Ergebnisse der Gestaltpsychologie," Bericht über den X. Kongress für experimentelle Psychologie, Jena: Gustav Fischer, 1928.



Frame 4 Frame 8 Frame 12

FIGURE 2

The simple perceptual devices described above represent the essential nature of many of the thought processes which sociologists and psychologists now believe are basic to creative thinking. They are generally schematic or pictorial patterns requiring use of language only in interpretation. They are, however, useless unless the participant learns to trace the analogy to decision-making through higher levels of complexity such as we will now describe.

Simple Language Devices

One stage higher in our metaphoric transition from the simple perceptual level of thought to the complex decision problem of innovative administration involves the presentation of information in the form of single words or "concepts." The thinking processes involved in using them creatively are basically the same, though more complex.

REMOTE ASSOCIATIONS: One of our most interesting devices for training innovative thought habits is called "remote associations."[7] The participant is confronted with a set of three words and is asked to find a fourth which makes a meaningful verbal pattern when associated with each of the three words taken separately. Any of the words may be used in any sense it may have. That is, the word may be considered merely a symbol; the problem is to associate to it a meaning context. Consider, for example, the words "traffic," "pickle," and "strawberry." A fourth word which meaningfully may be linked to any one of these is "jam." Next try:

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[7] Adapted from work by Sarnoff A. Mednick.

line pan corpse ________(fourth word which may go with any of these)

The answer is "dead." Consider first the analogy to the simple perceptual exercises with respect to fluent-flexible thinking. To solve this problem a person must search his memory for many different alternative meanings and meaningful verbal contexts for each of the words, generating a large quantity of qualitatively different candidates for use in a solution. If the set of elements (meanings) he employs is not broad enough, if he rigidly thinks of line as the opposite of staff or something to hang clothes on, he is defeated from the start. Yet fluent-flexible thinking must be supplemented here by the independent analytical, for among the wide range of alternatives he must select a single meaningful pattern. He might find a word which associates two words and use it to search through all the meanings of the third in a kind of match-mismatch process. Generally, as in achieving a creative solution to a problem, final insight comes with a flash and a feeling of satisfaction and achievement which stems from our own thinking mechanism[8] rather than those internal organs and external sources which we normally associate with pleasant emotions.

But the lessons derived from this simple exercise are deeper yet, for it serves to make clear the values of intuition and non-conscious thinking processes. Generally, solutions to these exercises do not come at once, but over time, perhaps even days or weeks. (Our participants were furnished a list of forty items during the second meeting of the course and worked on it for a short period in that and each remaining class.) Introspection and reflection reveals that our mind has been working -- forming and rejecting associations -- while we were doing other things. And this fits precisely with some of the latest and most interesting experimental findings from social science,[9] which confirm that the range of associations available to the nonconscious mind far exceeds those accessible to conscious effort alone.

The plastic alternation of opening and closing (idea generation and idea evaluation) as the essential nature of the creative process also stands out in this exercise. We generate ideas until we find one we like, then we evaluate it tentatively and reject it or set it aside while continuing to search. If at any point in time we must make a decision, we select it from those we have set aside, even if it does not entirely please us. It is in this sense that the thinking of the administrator parallels that of the scientist who searches for "hypotheses" and either rejects them or fits them into a tentative "theory" which at any time is the best available approximation to a state of nature which inevitably eludes us. It is also precisely this process to which the modern Bayesian statistical decision theory applies,[10] for it permits both administrator and scientist sequentially to gather and test information up to a determinable point at which the value of a decision outweighs the advantage of further exploration.

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[8] See Gordon, op. cit.

[9] Donald P. Spence and Bert Holland, "The Restricting Effects of Awareness: A Paradox and an Explanation," Journal of Abnormal and Social Psychology, 1962, 64, no. 3, p. 163-174.

WORD FINDING: A more simple device aimed at developing analytic independent thought on a verbal and numerical level was a series of slides, each of which involved two steps: (1) presentation of a column of numbers or adjectives, and (2) presentation of a matrix of numbers such that one of the columns contained the same numbers in some jumbled order, or a list of objects, only one of which could be accurately described by all the adjectives in the first slide. To illustrate:

First Slide	Second Slide	First Slide	Second Slide
4	4 6 9 4 2 9 9	amphibian	1. woman
3	2 7 3 3 9 2 2	slippery	2. snake
2	9 2 2 6 4 6 4	edible	3. fish
9	1 3 4 9 3 3 2	non-human	4. crook
6	6 5 2 4 6 7 6	self-propelling	5. banana
			6. moss

The principle is similar to "embedded figures." The administrative analogy is the same, except that we are now one step closer to working with problem elements which confront the administrator in making innovative decisions.

Simple Human Content Devices

In the next step of our metaphoric transition from simple to complex administrative innovative thought we introduced human content and sequenced human behavior into the elements for meaningful pattern formation.

CARTOON APPERCEPTION: In this device we introduced humor, which is rooted in nonconscious thought processes and avoids obvious personal identifications which might make participants anxious, yet retained a situation which requires empathic understanding -- imaginative putting one's self in the place of another. Due to the kindness of Walt Disney in providing basic materials, we were able to base this device on Mickey Mouse and Donald Duck. Each exercise involved the presentation of the same comic strip (an action sequence of 3 or 4 pictures) three times. The first time, one or more of the conversation balloons was partially empty; participants were encouraged to complete the balloons, using fluent-flexible thinking, in as many ways as possible, as well as selecting the most appropriate solutions, using independent analytic thinking. The second time, the missing text was partially restored, restricting the possible solutions and often requiring a shift in approach. The third time, all the text was restored except individual letters in key punch-line words. For example:

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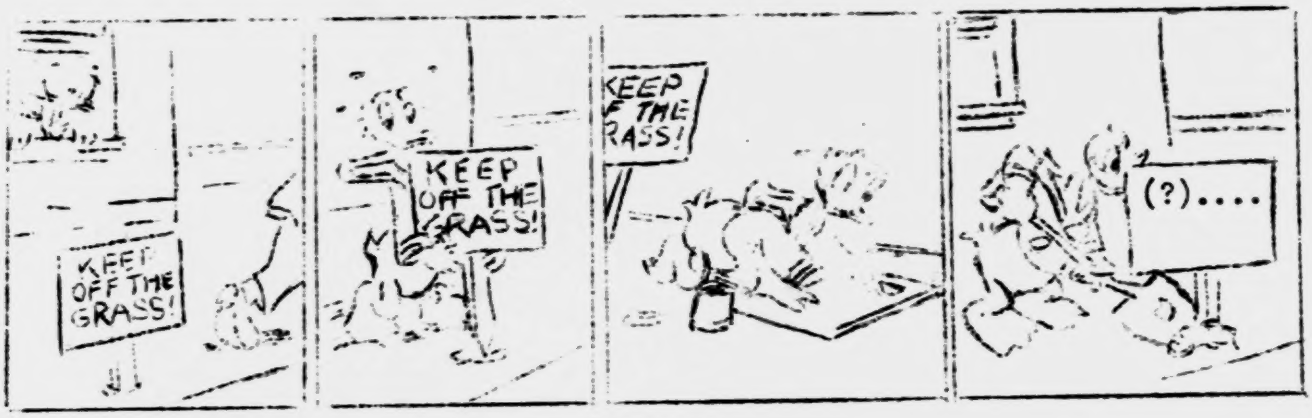
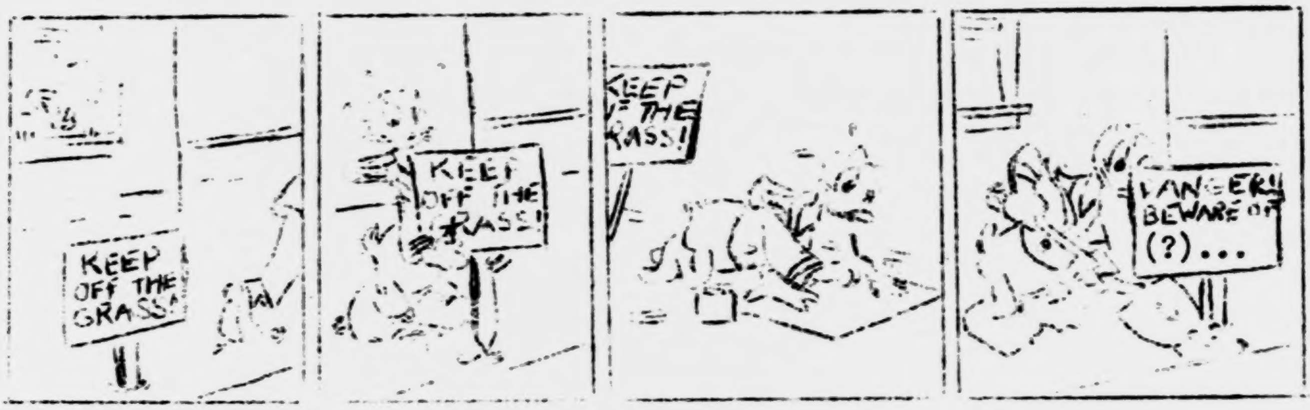
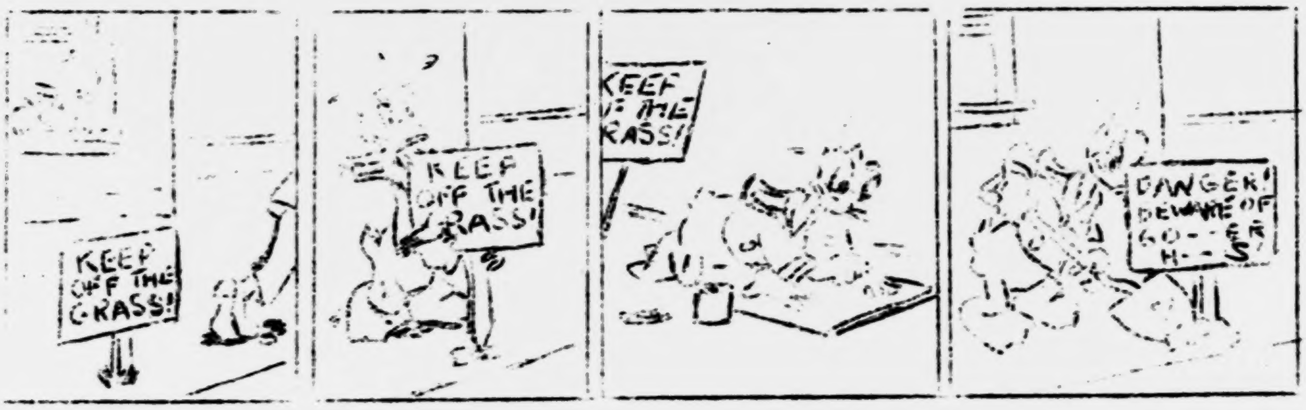
[10] For example, see H. V. Roberts, "The New Business Statistics", The Journal of Business, 1960, 32, No. 1, pp. 21-30.


KEEP OFF THE GRASS!
KEEP OFF THE GRASS!
KEEP OFF THE GRASS!
(?)....

PRESENTATION 1


KEEP OFF THE GRASS!
KEEP OFF THE GRASS!
KEEP OFF THE GRASS!
DANGER! BEWARE OF (?)...

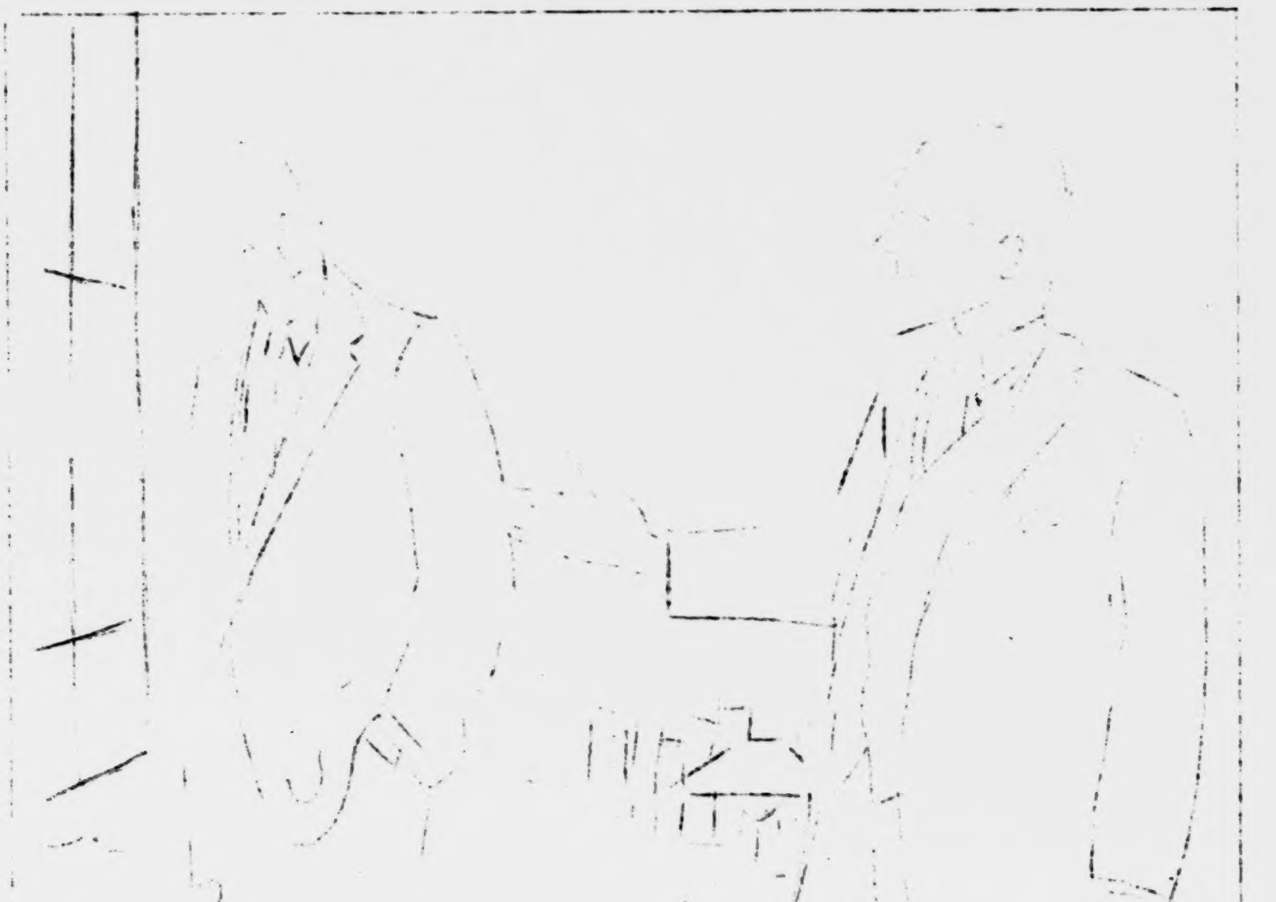
PRESENTATION 2


KEEP OFF THE GRASS!
KEEP OFF THE GRASS!
KEEP OFF THE GRASS!
DANGER! BEWARE OF GO--ER H--S

PRESENTATION 3

At first the problem-solver must rely largely on cues from the behavioral sequence. Later he is more dependent on verbal cues. The requirement to reach a decision based on partial information, then change it, proves quite difficult for some people. When the first decision that appealed to them proved to be wrong, the difficulty was especially great. However, when an administrator works with people he continually faces this kind of decision.

EXECUTIVE APPERCEPTION: In administrative decision-making personal identifications and anxieties are frequently involved. Evidence from the behavioral sciences indicates that the successful leader, working with persons of diverse backgrounds, retains a certain degree of psychological distance. With the executive apperception device we attempt to increase social objectivity of the executive in his interpretation of organizational behavior. The participant examines a picture such as the following:



The participant is encouraged to develop as many interpretations as possible of the situation portrayed. He reports these to the teacher and the class for their interpretation. The goal is to indicate the wide range of interpretations which can follow from the same cue information. The fluency-flexibility of such interpretations and the processes of selection of one final interpretation is discussed to illustrate the problem-solving sequence within a behavioral context.

Complex Human Content Devices

These materials demonstrate problem-solving under conditions which approximate actual organizational life. There were three devices:

CATEGORIZATION OF ORGANIZATIONAL STEREOTYPES: In every office we find stereotyping of individuals; for example, "grind," "apple-polisher," "playboy," "lovely but dumb," "sharp cookie," "individualist," "one-of-the-gang," etc. In this exercise each participant was given a set of small cards, each of which bore the name of an organizational stereotype. He was asked to identify each one with someone in his experience, then to categorize them according to their similarities and differences, always striving for quantity and variety of categories as well as common characteristics among superficially different people. By repeatedly recategorizing the same cards (people) participants gained insight into the tentative nature of seemingly meaningful patterns and the variety of viewpoints which innovative problem-solving in administration may be approached.

BRIEF SITUATIONS: Brief situations was another of our most successful devices. It consisted of short vignettes of typical administrative situations, such as:

> "Your boss has asked you for ideas on a new problem. He never accepted any of your ideas yet."
>
> "Your co-workers and other people on your same level appear to avoid you more than usual."
>
> "Your understudy helped you put on your coat today. He never did it before."

Each of these scenes is presented as a direct analogue to simple perceptual devices. Participants were asked to use fluent-flexible thinking in defining problems implied by the scene, in imagining the sequence of events and context in which the problem arose, and in producing alternative courses of action which might solve the problem. They used independent analytic thinking in the initial sensing of a problem, in selecting the most likely definition of the problem, and, given a definition and a set of alternative solutions, in selecting the one which seemed most promising. Working as a group in classroom discussion helped participants to enlarge their repertory of perspectives.

ADMINISTRATIVE CASES: Several fictional cases were designed to elicit innovative thinking on policy questions. They were presented as a booklet in the form of letter exchanges and dialogues. Most of them were purposely exaggerated in a humorous way so as to encourage fluent-flexible thought. For example, there was the case of the regional office which received orders from headquarters (a letter) showing no comprehension of local circumstances. A dialogue between local manager Ames and his assistant led to their reply (a letter) reflecting their decision that it was not prudent to attempt to enlighten those at headquarters in view of their presumed incompetence. It may be noted that as the complexity of the informational dimension of the problem increases, it becomes more difficult to isolate and order the individual aspects of innovation. The instructor's task in preserving the analogies between simple and complex materials is proportionately difficult.

General Method

In any one session it was not possible to attack each level of complexity. We sought to maintain a balance between simple pictorial representation and complex administrative reality. A typical session might include: (1) embedded figures, (2) remote associations, (3) brief situations, (4) cases, (5) color-word slides. We emphasized facility in metaphoric transition -- the use of analogies which relate the seemingly irrelevant simple material and the complex problems of organizational life. In summary, we attempted to provide practice in innovative cognitive skills on four levels: (1) simple perceptual problems, (2) simple verbal problems, (3) simple exercises involving the human context, and (4) complex exercises involving the human organization. We endeavored to teach participants to trace the processes common throughout.

A Personality-Insight Approach

The Personality-Insight approach assumed that innovative behavior is a function of understanding the nature of creative processes and how they relate to the personality of the innovator. It enabled us to meet another of our major objectives directly, to enable the executive to recognize and value innovative behavior in others. Even though his own innovative capacities may not increase, he may better be able to develop in his firm a positive climate toward innovation.

The kind of person who readily uses innovative thought processes outlined above has been described for us in the social and psychological sciences. He need not be an "organization man", nor need he be a maverick. But he must have a strong, independent, autonomous self which enables him to tolerate the ambiguous situations that are inevitably present prior to successful problem solving.

This course began with an intensive discussion of the nature of the human self, stressing its twofold nature.-- a repertory of "roles" which are played in accord with social expectations,[11] and the unique aspects of personality. The individual, as a unique being, sui generis, may either use the "roles" in pursuit of his own ends,[12] surrender his individuality to a series of social masks,[13] or blend the two creatively. We discussed the unavoidable conflict between self and organizational expectations.[14] We emphasized, however, two main themes: (1) adjustment, adaptation, and change of the organization in its environment and self fulfillment in this setting; and (2) the intuitive, nonconscious, and "nonrational" aspects of innovative behavior.[15] As the course progressed we used extensively the theory outlined at the beginning of our paper, going into some detail of the works of social scientists upon which it is based. We also used most of the devices employed in the Cognitive Skills approach. However, we gave no repetitive practice with single devices; we used them only to give insight into the essential nature of the creative thinking processes.

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[11] For example, see E. Goffman, The Presentation of Self in Everyday Life (Garden City, N.Y.: Doubleday, 1959).

[12] For example, see A. T. Collier, "Faith in a Creative Society," Harvard Business Review, July-August 1958, p. 123.

[13] See J. H. Rice, "Existentialism for the Businessman," Harvard Business Review, March-April 1960, p. 135; also L. Binswanger, Drei Formen Missglueckten Daseins Tuebingen (Max Niemeyer Verlag, 1956), p. 192.

[14] See C. Argyris, "The Organization: What Makes it Healthy?", Harvard Business Review, November-December 1958, p. 107, and "Organizational Effectiveness Under Stress," Harvard Business Review, May-June 1960, p. 137. However, note that these do not concern the personal and interpersonal need of top level executives themselves.

[15] Contrast this aspect of the "subconscious" with W. C. Schutz, "Interpersonal Underworld," Harvard Business Review, July-August 1958, p. 123.

Our teaching methods recapitulated the phasic alternation of opening and closing inherent to the creative process itself. The instructor began the course on a fairly controlled (directive) basis. Then he reduced the directive control, emphasizing flexibility and fluency in the interpretation of personality and insight factors. He then assumed a directive teaching style again, introducing brief lectures, followed, again, by periods of permissive classroom control intended to maximize fluent-flexible response.

In this course we introduced three new relatively complex devices:

HEURISTICS: TOOLS FOR DISCOVERY OF PROBLEMS AND THEIR SOLUTIONS. This 39-page booklet outlined the basic nature of problem solving and a variety of approaches to such problems. At one extreme, cases involving a problem and a standard way of solving it concern innovative thinking only to the extent that they challenge a person to develop a different or better solution. At the other extreme, the problem may be unclear, or there may be no standard solution. When the problem is clear one either may use a standard approach or may try a new one. Rational approaches include: (1) use of analogy, (2) restatement, (3) simplification, and (4) working backwards. There are other "heuristics" -- many of them superficially irrational -- useful in discovering both problems and their solutions[16] by stimulating intuitional, nonconscious thinking processes. For example, the method of Contradiction consists of "taking the contrary viewpoint to existing theory or ways of behaving and classifying things for no reason other than that the existing is tending to become dogmatically accepted as traditional and innately 'right'."

Participants were asked to read several pages at the beginning of the booklet, study the examples, and do some exercises. Since the book and the exercises are difficult and time-consuming -- they could easily provide a basis for a semester course -- we confined our use of them to insight into the variety of innovative approaches to problems and their relation to the personality of the problem-solver and his institution.

FIXED ROLE PLAY ("INNOVATIVE STEVE"). Participants were given a description of an ideal innovative executive, adapted from research findings, whom we called "Innovative Steve". They were asked to study this person and model their behavior after him during the last two weeks of the course in situations where censure for ignoring others' social expectations for them would be minimal. As their new behavior style continued, they were asked to extend it into more familiar situations.

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[16] We are indebted for a number of these to A. Moles, *La Creation Scientifique* (Geneve: Edition Kister, 1959).

Part of our description of Innovative Steve follows:

> "Innovative Steve is the kind of man who may appear at first a little distant and different. But should it turn out that you and he have common interests, he becomes vital and fascinating. He is very much alive, full of an energy which stems from his absorption in problems which interest him. His main interests are few, but broadly conceived and deep, so that on the surface they appear many and varied, inspired by curiosity and a desire to understand more and more about them. . . . Success in life, for him, is bound at least as closely to his achievement of greater understanding and progress in his areas of interest, his personal growth, as to the rewards of money and love which all treasure. . . . His broad interpretation of what may be helpful and relevant to his interests is closely allied to his willingness to tolerate ambiguity -- his preference to suspend judgment until all the information is in. Yet he is as quick as anyone to reach an important decision when the situation gives no choice. Thus he tends to view decision-making in terms of its present and future meaning for the organization as a whole and clearly discerns when a decision is necessary and when it is not -- when postponement of action will inconvenience others or result in greater losses than might be gained by perfecting a course of action still further. . . ."

The rationale for the fixed-role-play approach is that by teaching the individual to model himself after someone else he gradually modifies his image of himself and becomes in fact a somewhat different person. Of course Steve also serves as an excellent model of how innovative qualities appear in others. That is, the participant learns how to recognize the innovator -- in particular, how to distinguish him from the nonconformist, the person who is different merely for the sake of being different. Clearly the success of this technique is enhanced by mutual discussion of participants' experiences over an extended period of time. In our course its use by and direct effect on the participant was difficult to assess.

PROGRESSIVE CONCEPT REFINEMENT: A word may be taken as a symbol; its meaning in a particular context is gleaned from the ways in which it resembles and differs from words with which it is associated. This device successively presented a number of individual words. Each time the participant was asked to give the ways in which the present word resembled and differed from all the preceding words taken as a group. For example, try this with the following words, taken successively: horn, bell, radio, newspaper, book, painting, education, confusion. It becomes progressively more difficult to think of similarities and differences between a word and its group of predecessors. However, using fluent-flexible thinking to generate many alternative similarities and differences each time, we more readily end up with the unifying concept "communication" than if we think of only a single alternative each time. In the latter case we tend to persevere in retaining our previous notions, no matter how farfetched. Used insightfully, the device is excellent for achieving understanding of the value of fluent-flexible thinking and conveying a more thorough knowledge of the nonrational, intuitional kinds of thought. Here they appear as pitfalls, as false paths to which the mind naturally inclines. Thus we have here an excellent base for discussion of appropriate and inappropriate applications of intuition.

Some Final Critical Considerations

Section VI of this report discusses in detail some of the methodological and pedagogical implications of our experimental curricula. We would like to note briefly several observations with respect to strengths and weaknesses of elements of the courses.

In a course structured about cognitive aptitudes and skills-practice, as distinct from one which focuses upon personality and insight factors, the role of the teacher in the educational process can be reduced considerably. In our practice-skills course the teacher became essentially an administrator of practice devices. This has very real advantages if teacher skill and experience are limited. It is also an advantage if classes are large.

Teachers in our cognitive-aptitude course felt, on the other hand, that a "stripped-down" skills practice approach to innovation and creativity is dehumanized. Also, such an approach tends to produce anxiety and resistence in the student, and for the same reason. Skills-practice alone produces a somewhat threatening test atmosphere in which some invidious comparison and defensive behavior develops. The steady, methodical pacing of such courses has its own characteristic fatigue concomitants.

The personality-insight course which we developed involves the teacher deeply and obviously. It is, from that point of view, a good deal more rewarding to the teacher than a skills-practice form of course. It provides teachers a great deal of latitude in the use of brief information-supplying lectures, exploratory comment on side issues, as well as on seemingly irrelevant material. The personality-insight approach also permits the teacher to manipulate constructively the anxiety which develops when instruments of new or threatening nature are used. The use of devices with humorous overtones, such as our cartoon apperception device, was also easier in this kind of course. The humorous overtones of the context, as well as the importance of identifying the abstract principle involved in the exercise, regardless of the context, were more readily used in this kind of course. Optimal size, however, in a personality-insight course is limited. Our view is that the ideal size is twelve participants.

With respect to difficulties in the use of specific teaching devices, we can make several additional generalizations at this point. Good case material drawing on government administration is rare. We had difficulty in developing good cases, and those we used seemed rather simple and obvious to participants. Most materials, on the other hand, drawn from business and industry seem irrelevant to the practicing government administrator. A financial profit and loss calculus cannot be applied easily to complex service values and public policy. Strict "efficiency" measures of administrative innovations from private enterprise are difficult to apply to government, especially where politics and social issues are involved. There is considerable need for good government administration case material.

A parallel problem confronted us in the use of role-playing. We used role-play little. Our experience in other educational programs where role-play has been used a great deal suggests that the sense of artificiality of role-play evokes skepticism and resistence. This is particularly so among more intelligent and experienced administrators. Our effort to use fixed-role play was an attempt to overcome this problem to some degree. Its value remains limited, however, because it is difficult to control the individual's behavior while on the job. It is difficult to motivate fixed role play in an organization, especially if the organization is a counter influence. It is always problematic, moreover, whether or not a significant effort to stay "in role" has actually developed.

Our experience with so-called "brainstorming" methods was disappointing. At one point we used a brainstorming film which portrayed a nationally famous quiz show star demonstrating the process with a panel of television personalities. The film quickly exhausted the interest of the participants in our classes and had to be shut off before completion. Again, the more intelligent and experienced participants were the most impatient with its apparent triviality. We feel that the concept of suspended judgment is too complex and important to administrative innovation to be treated merely at this level.

Several of our more promising teaching devices require further testing and development. Our "imaginative Gestalt formation" exercise, for example, requires further elaboration to maximize individual differences in response. Its improvement will necessitate extension of the mid-point of the slide series. Our present device (see page 8) does not elicit a sufficiently broad range of solution time.

Subsequent work of the Center, based upon the experimental work of the courses we have described, has involved integration of elements of the cognitive aptitude and personality-insight courses with course materials concerning invention, social change, and cultural adaptation. One such curriculum served as a thirty-hour unit of studies in the Center's 1962 (July 1 to August 10) Summer Institute in Executive Development for Federal Administrators (GS 13-18).[17]

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[17] These developments will be reported by the Center in papers to be completed in 1963.

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Section V

EVALUATION OF THE PROGRAMS

Effects of Educational Programs and Perceived Organizational Climate Upon Changes in Innovative Administrative Behavior

Garlie A. Forehand and William L. Libby, Jr.

This section reports an experimental evaluation of the research seminars whose rationale and development were described in Section IV. One experimental seminar was based on a conception of innovation as a complex of cognitive aptitudes centering about fluency, flexibility, sensitivity to problems, field articulation, reservation of judgment, Gestalt formation and redefinition; this seminar will be referred to in this paper as the cognitive aptitude seminar. The second experimental seminar was based upon a conception of innovation as a personality characteristic, involving such traits as self reliance, self evaluation, openness to experience, and willingness to rely on primary process thinking; the program attempted to facilitate insight into these processes and will be referred to as the insight seminar. The effects of these seminars on a number of dependent variables was assessed, and compared with those of a control seminar (actually two separate seminars, whose participants were grouped together in the following analyses). The control seminars were similar in design and content to courses regularly offered in management development programs (see, e.g., Mailick, 1958), focussing on the one hand on "human relations and administration," and, on the other on "organization and administration." All seminars met for five weekly sessions of three hours each.

In order to control for effects resulting from variation in instructor effectiveness, instructors participated in the design and conduct of the seminars. Each instructor taught both experimental seminars and a control seminar. In the analyses that follow, the results for the two instructors are combined within seminars.

A second independent variable was the nature of the organizational climates in which the participants worked, as perceived by the participants themselves. Participants were classified according to whether they perceived their organizations as relatively "rule-centered" or "bureaucratic," or as relatively "group-centered" or "democratic." The Organizational Perception Instrument by means of which this variable was defined is described in Section II, along with empirical properties of groups who describe their organizations as "rule-centered" and "group-centered."

The dependent variables, listed and described in Table 1, were selected from the variables of the predictor study, reported in Section III, with the exception of the Remote Associates Test. All of the cognitive aptitude variables selected were significantly related to superiors' or peers' assessments, or both, in at least one of the subsamples of the predictor study.

Insert Table 1 about here

Procedures

The seminars were conducted during January, February and March of 1962. Participation was voluntary, and was arranged with the cooperation of training officers of federal agencies in the Chicago area. The seminars were conducted as a part of the regular series of management programs offered by the Center for Programs in Government Administration, and credit toward the certificate offered in that series was given;[1] tuition was not charged.

Subjects. The subjects were persons holding administrative positions in federal agencies. A total of 10 agencies were represented; all participants worked in the Chicago area. A total of 160 administrators registered for the programs; of these, 127 completed the program and provided sufficient data for inclusion in the analysis. A number of demographic characteristics of these 127 subjects, are summarized by subgroups in Table 2.

Insert Table 2 about here

Design. The experimental design is represented schematically in figure 1. Procedures for assigning participants to subgroups are described below.

Table 1

Dependent Variables

Instrument	Construct	Description of Instrument	Reference
SUPERIORS' AND PEERS' ASSESSMENTS			
1. Organizational Performance Questionnaire: Innovative Rating Scale	Innovative Behavior	Ten 7-point rating scales. Ratings by superiors and peers on descriptions of innovative behavior. Example: "Works creatively to develop new and unusual solutions to organizational problems."	Section II of this report.
2. Organizational Performance Questionnaire: Innovative Forced Choice Scale	Innovative Behavior	Choice of most relevant adjective from pairs having one "innovative" adj. (original, flexible, inquiring, independent, self-reliant) and one "non-innovative" adj. (industrious, prudent, dependable, stable, cooperative).	*Ibid*.
3. Organizational Performance Questionnaire: Global Rating Scale	General Administrative Effectiveness	Three 7-point rating scales. Ratings by superiors and peers on descriptions of general effectiveness. Example: "Capable of handling almost any executive level job satisfactorily."	*Ibid*.
TEST VARIABLES			
4. Apparatus Test	Sensitivity to problems	S. suggests two improvements for common appliances.	Guilford, J. P. & Merrifield, P. R., The structure of intellect model: its uses and implication. *Rep*. *Psychol*. *Lab*., *USC*, No. 24, 1960.
5. Social Institutions	Sensitivity to Problems; penetration	S. suggests two improvements for a social institution.	Guilford, J. P., *et al*, A factor analytic study across the domains of reasoning, creativity and evaluation, *Rep*. *Psychol*. *Lab*., *USC*, Nos. 11 and 16, 1954 and 1956.
6. Similarities	Penetration	S. writes 6 ways in which common objects of a pair are alike.	Guilford & Merrifield, *op*. *cit*.

Table 1 (cont'd)

Instrument	Construct	Description of Instrument	Reference
7. Object Synthesis	Semantic Redefinition	S. names an object that could be made by combining two specified objects.	Ibid.
8. Brick Uses	Spontaneous flexibility; ideational fluency	S. writes as many uses as he can think of for a brick.	Ibid.
9. D-Scale	Dogmatism	Attitude items reflecting "direction-free" (i.e. neither "rightist" nor "leftist") dogmatism. Dogmatism defined in part as a "closed ... structure of belief and disbelief, organized around ... beliefs about authority."	Rokeach, M., The Open and Closed Mind, New York: Basic Books, 1960.
10. Remote Associates Test[a]	Ability to make remote associations	S. supplies a word which will be associated with each of three apparently unrelated words (Example: stimulus words: rat, blue, cottage; answer: cheese).	Mednick, S., Remote Associates Test, Ann Arbor, Mich., 1962.

[a] Used for the two innovation courses only.

Table 2

Characteristics of Participants in Research Seminars

Course Group:	"Cognitive"				"Insight"				"Control"			
Org. Percept. Group:[a]	GC (N=21)		RC (N=15)		GC (N=22)		RC (N=18)		GC (N=26)		RC (N=25)	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Age	26-57	44.5	29-56	41.4	38-67	47.5	32-65	46.0	28-62	40.2	24-59	46.1
Years of education . .	12-17	15.1	12-20	15.0	12-19	15.1	12-20	15.9	12-20	15.0	12-19	15.2
Grade level. . . .	9-15	12.4	9-14	12.4	9-15	12.8	9-14	12.2	9-15	12.8	9-15	12.3
Years of government service	4-33	16.2	0.5-30	10.6	5.5-25	17.7	2.0-26.5	15.7	3.5-26	15.3	6.0-26	16.6
Years in present job . .	0.3-13.3	4.3	0.0-10.0	2.9	0.0-10.5	4.7	0.8-16.0	3.8	0.0-7.0	2.8	0.2-16.0	2.6
Number employees supervised	0-400	55.8	0-200	31.6	0-375	86.6	0-90	19.7	0-119	16.9	0-435	30.8
Proportion of "line" jobs	--	.43	--	.50	--	.67	--	.67	--	.38	--	.3

[a] GC: Group-Centered; RC: Rule-Centered.

Insert Figure 1 about here

The subjects who were enrolled in a given seminar (i.e., a given column in Fig. 1) met together one week prior to the formal commencement of the course. They heard a brief orienting lecture by a guest speaker[2] (not one of the course instructors). The topic for this lecture for the two experimental groups was "Innovation and Administration;" the topic for the control group was "Organization, Human Relations, and Administration." After the lecture, the nature and purpose of the research was described, and participants took pre-tests and completed the Organizational Perception Instrument.

The Organizational Perception Instrument was scored before the first formal session. (See Section II, pp. 6-7 for a description of the scoring method.) The organizational perception score is bi-polar, as discussed in Section II: subjects make choices between alternatives keyed as "rule-centered" and those keyed as "group-centered," in describing their organizations' practices. Thus, scores range from high-rule-centered to high-group-centered. Those participants in a given seminar who scored above the median when the instrument was scored in the "group-centered" direction were termed the "group-centered climate" subsample. Those below the median were termed the "rule-centered climate" subsample. Each of these climate groups was divided randomly in half, and one half of each group was assigned at random to each of the two instructors.

The median "group-centered" scores (which are the inverse of rule-centered scores) for the subsamples are presented below. The three subsamples designated "group-centered" are not significantly different from one another by the three sample median test (Walker & Lev, 1953, pp. 435-436).

	Group-Centered	Rule-Centered
Cognitive Seminar	15.5	10.0
Personality Seminar	16.6	8.8
Control Seminar	16.5	8.5

Figure 1

Experimental Design

		Seminar		
		Cognitive Aptitude	Personality -Insight	Control
Organizational Climate[a]	Group-Centered			
	Rule-Centered			

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a. As perceived by the subjects.

Data collection. Pre-participation measures based upon psychological tests and questionnaires (variables 4 through 11 in Table 1) were collected in group testing sessions one week prior to the beginning of the course.[3] Post-participation measures were collected immediately after the close of the last session. On all tests except Brick Uses and the D-Scale, subjects took a different form of the test on the "before" and "after" occasions. Social Institutions, Apparatus, Object Synthesis and Similarities, each have two halves with approximately equal means and variances (see the references to these tests). Half of the subjects in each subsample took part I on pre-test and part II on post-test. The order was reversed for the other half of the subjects. All subjects took Part A of Remote Associates on pre-test and Part B on post-test. Pre-participation measures based upon ratings by superiors and peers were obtained from questionnaires mailed to superiors and peers during the week prior to the beginning of the course. Post-participation questionnaires were obtained from superiors and peers from two to three months after the conclusion of the relevant seminar.

Analysis. Differences between pre- and post-participation scores on each of the dependent variables were computed. These difference scores were analyzed by means of analysis of variance, using a computing routine adapted to unequal size of subsamples (Snedecor, 1956, pp. 382-385). A "fixed mean" model is the appropriate model of sources of variation; therefore an error term based upon variation within clases was used to test both main effects and interaction in each of the analyses.

Results

Results of the analyses of variance are summarized in Table 3. It will be noted in the case of two of the seven objectively measured dependent variables the effect of varying course content is statistically significant. In two cases the effect of varying organizational perceptions is significant, and in one case

Insert Table 3 about here

Table 3

Results of Analyses of Variance

	Source of Variation							
Dependent Variable	Error term		Course content (d.f.=2)		Org. Perception (d.f.=1)		Interaction (d.f.=2)	
SUPERIORS' AND PEERS' ASSESSMENTS	SS	df	SS	F	SS	F	SS	F
1a. Innovation Rating: Superior	5837	114	188	1.84	264	5.16*	40.7	0.39
1b. Innovation Rating: Peer	4232	113	8	0.11	27	0.72	8.7	0.12
2a. Innovation forced-choice assessment: Superior	2475	111	68	1.52	0	0.00	2.1	0.10
2b. Innovation forced-choice assessment: Peer	2629	112	20	0.43	9	0.38	12.5	0.27
3a Global rating: Superior	1299	113	68	3.08*	0	0.00	14.9	0.67
3b. Global rating: Peer	1057	113	0	0.00	0	0.00	0.1	0.01
TEST VARIABLES								
4. Apparatus Test	1428	123	12	0.52	36	3.10	32.7	1.50
5. Social Institutions	910	121	12	0.80	18	2.39	2.3	0.15
6. Similarities	4679	123	36	0.47	99	2.60	58.3	0.77
7. Object Synthesis	1046	121	8	0.46	18	2.08	8.8	0.51
8. Brick Uses	4276	121	796	11.27**	180	5.10*	1.5	0.02
9. D-Scale	9362	81	1596	6.91**	5184	44.84**	6738.0	29.14**
10. Remote Associates[a]	657	67	0	0.01	0	0.00	0.1	0.01

a. Only the two experimental treatments compared; d.f. for course content = 1.

*Significant at .05 level.

**Significant at .01 level.

interaction is significant. Change on none of the four innovative behavior assessments (two made by peers and two made by superiors) is significantly related to course content, but one of them is related to organizational perceptions. One of the two general effectiveness ratings is related to course content. The following paragraphs describe the apparent origin of the significant effects.[4]

Brick Uses. The mean increase in scores is 6.9 for the cognitive aptitude seminar, 7.3 for the insight seminar and 2.2 for the control seminar. The two innovation seminars appear to have affected performance to an approximately equal degree, and both to a greater degree than the control seminar. The mean change score for the "rule-centered" group (across seminars) is 6.6; for the "group-centered" group it is 4.3. The significant effect for the organizational perception variable thus reflects improvement of subjects in the rule-centered subsample superior to that in the group-centered subsample. This result apparently does not stem from differences in initial scores in the two groups (means of 11.4 and 10.6 for rule-centered and group-centered, respectively).

The D-Scale. Mean dogmatism in the insight seminar scores decreased by 8.5 points, increased in the control seminar by 2.0 points, and increased in the cognitive aptitude seminar by 11.0 points. The two innovation seminars thus appear to affect this variable in opposite directions, while the control seminar has little effect. The organizational perception effect was again in favor of the subjects who perceived their organizations as rule-centered (a mean decrease in dogmatism of 6.4 points as compared to an increase of 9.3 for those in the group-centered subsample). This result is apparently not due to differences in initial level in the two groups (means of 136.0 and 138.2, respectively). The interaction effect appears to be centered in the cell containing subjects who perceived their organizations as rule-centered and took the insight seminar. That group had a mean decrease in dogmatism of 34.2 points, as compared to increases or lack of change in all the other cells.

Superiors' ratings of general effectiveness (global ratings). The effect of course content on change in this variable is barely significant at the .05 level. Mean change scores for the three groups were: +1.0 for the control group, +0.7 for the insight group, and -0.8 for the cognitive group. Since the control course was designed for maximum impact on general effectiveness (as opposed to specific impact on innovativeness), the superiority of that course to the others was to have been expected. Impact of similarly designed (but longer) programs upon global evaluations by organizational associates has been previously demonstrated (Guetzkow, Forehand & James, 1962). The fact that the insight-oriented seminar produced a nearly equal increase suggests that the content of that seminar has a bearing upon general administrative effectiveness.

Superiors' innovation rating. The "rule-centered" group gained an average of 2.1 points, while the "group-centered" group gained an average of 0.5 points. Initial levels of this variable were 50.4 and 59.1, respectively. Again, the organizational perception effect is in favor of those who see their organizations as rule-centered. The effect reflects differences in initial level of the variable, a difference that leaves more "room for improvement" for the participants with rule-centered organizational perceptions.

Discussion

Other approaches to education for creativity are almost invariably described in terms of cognitive processes of the type that we emphasized in our cognitive aptitude seminar (see, e.g., Parnes and Harding, pp. 305-342). A number of studies have shown some effects of such programs upon quantity and quality of ideas (e.g., Meadow & Parnes, 1959). One of the objectives of the present research was to attempt to study in isolation the contributions of two different curriculum elements to such effects. One curriculum element focussed upon skills in the cognitive processes involved in "creative" problem solving; the other upon insight into innovative processes more broadly defined. Implications of our results are discussed in Section VI. The present discussion is restricted to a brief summary of our interpretation of the findings.

The emphasis on problem-solving skills alone did not produce the kinds of effects for which such programs are designed. The cognitive aptitudes program produced greater effects than the control program upon only one of five cognitive aptitude tests (Brick Uses), and on that test the "insight" approach was equally effective. The "insight" approach also produced a greater decrease in endorsement of dogmatic statements than did either the cognitive aptitude or the control seminar. It was also almost as effective as the more generalized control seminar in producing improvement in general administrative effectiveness.

Examination of the dependent variables on which significant course-content effects were observed, suggests that the changes that occurred take the form of changes in attitude or set rather than in cognitive aptitudes or skills. Other programs in which both skill and insight are combined have found effects upon skills. It may be suggested that the attitude changes effected by the insight approach are needed in order to produce observable improvements in creative problem-solving skills. Two ways in which such an effect might operate are (a) providing motivation for the acquisition of skills, and (b) providing a context for generalizing and applying the skills attained. Thus, an educational program that combines our two curriculum elements might produce improvement in skills that the skills-oriented approach alone did not. In summary, it may be suggested that the insight approach can have effects independently of the skills approach; a skills approach in isolation is less likely to have impact, but might be effective in conjunction with a greater emphasis upon insight into innovative processes.

The results of this study point up a problem evidenced by many other studies of management development: whatever the effects of such programs, it is difficult to achieve an impact sufficient to be reflected in the perceptions of organizational associates. The difficulties of interpreting evaluations in terms of such reports

-- the subtleness of effects, variations in the sensitivity of raters, etc. -- have often been recognized. However, it has been shown that under certain circumstances educational influence can be demonstrated through perceptions of organizational associates (Guetzkow, Forehand & James, 1962). Two of those circumstances suggest directions for increasing the impact of the innovation programs: the programs that are most effective have been of considerably longer range than those discussed here; and program effectiveness has been most readily reflected in perceptions of associates when officers of the organizations deliberately encourage and support attempts to apply course material in the participants' jobs. It would appear that further efforts to increase organizational impact must strive both to magnify the impact on the participant of the educational experience, and to provide an organizational climate in which such impact can be demonstrated.

The way in which participants perceived their organizations was significantly related to their gain from educational experience in three cases. In all of these cases participants who described their organizations as "rule-centered" or "bureaucratic" gained relatively more than those who described their organizations as "group-centered" or "democratic." Other results were in the same direction, but failed to reach significance. Participants' perceptions undoubtedly reflect a complex of both organizational and personal characteristics, but to a large degree it is the perception itself, regardless of its origin, that can be expected to influence behavior. The participants who interpreted their organizational climates as restricting expressions of innovative behavior were apparently more amenable to changes in the behaviors we studied than were those who perceived their organizations as less restrictive. In some instances their scores were initially lower, so that the effect was one of "closing the gap." In other instances the two groups did not differ notably in initial scores. These results lend support to previous hypotheses that the effectiveness of executive development programs depend, in large measure, on the "match" between participant and educational approach, and illustrate the potential usefulness of a plan for selecting and placing candidates for such programs, as advocated by James and Steggert (in press).

Footnotes

1. A certificate is awarded at the completion of five 11-week courses. Half-course credit was given for the research seminars.
2. Professor Harold Guetzkow was the guest speaker in each instance.
3. An exception was the Remote Associates Test, which was administered during the first class session.
4. More formal supplementary analyses, including multiple comparisons, orthogonal comparisons and analyses of covariance are being undertaken, and will be reported in published reports of the research.

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Section VI

IMPLICATIONS AND TENTATIVE CONCLUSIONS

Suggestions for Further Research

Garlie A. Forehand

A number of interpretations of results regarding the nature of innovative administrative behavior, its measurement and its susceptibility to educational modification have been offered in preceding sections. Those interpretations have a number of implications for pedagogy, for organizational administration and for psychological theory, which are discussed below. These implications, however, depend upon the verification and elaboration of the interpretations through further research.

In the studies of assessments of innovative behavior and their correlates, a pattern of relationships among assessments of behavior, organizational relationship of assessor and assessee, and perceived organizational climate appear to emerge. In organizations that are described as group-centered, assessments by peers are more closely related to cognitive and personality variables than are those made by superiors. In organizations described as rule-centered the reverse is true. Further peers' assessments tend to be predicted best by cognitive aptitude variables, superiors' assessments by interpersonal variables. There is also evidence that superiors place a higher value on the innovative behavior of subordinates in rule-centered organizations than in group-centered organizations, while peers tend to value innovativeness in their co-workers more when they work in group-centered organizations.

A possible explanation which would account economically for most of these relationships is suggested by our original classification of personal determinants of creativity into personality and cognitive factors. Innovative behavior as defined both conceptually and operationally has two components: the social behavior component (encompassing some personality factors, and typified by "independent" and "self-reliant" in the forced choice measure); and the cognitive component ("flexible", "original"). Although it is likely that perceivers will expect the two components to be related, they are clearly not synonymous. The sensitivity of a rater to the two components in an individual would depend in part upon the nature of the rater's association with the individual. Present results suggest some ways in which the two components would operate, and hence some hypotheses for further study. First, it is suggested that peers in general are more likely than superiors to be sensitive to the cognitive component, since peers see more of the individual's day-to-day functioning, more evidence of his problem-solving processes. Within a heterogeneous group of peers, those whose organizations are "group-centered" are more likely to be sensitive to the cognitive component than are those whose organizations are "rule-centered," since the former climate encourages and the latter restricts informal communicative relationships among peers. Superiors in general are more likely than peers to have contact with an individual in a formal "reporting" relationship, when the individual is more or less consciously making a "presentation of self." Thus superiors might be more sensitive to the social behavior component -- including evidence of aggressive needs and dominance. Regarding the effect of organizational climate on superiors' perceptions, it may be suggested that rule-centered climate, by necessitating the "monitoring" of subordinates by superiors would increase the superior's sensitivity to both the processes involved in reaching solutions and the social posture taken in presenting and defending them.

A preliminary test of the "two-component" hypothesis can be made in the context of the data of the present study. The forced choice innovation measure could be scored to define two components -- a social component (based on the adjectives, "self-reliant" and "independent") and a cognitive component (based on the adjectives, "original" and "flexible"). Analyses might examine (a) the correlation of the component with the total score, which provides an indication of the extent to which systematic variance is contributed by the particular component, and (b) the correlation of each component with predictors, and the contribution of each component to prediction. It would be expected that the contribution of the cognitive component in each analysis will be greater for peers' than for superiors' assessments, while the contribution of the social component will be greater for superiors' assessments.

In discussing the above results, it was suggested that the distinction between rule-centered and group-centered climates is related to the distinction drawn by Blau and Scott (1962) between hierarchical and non-hierarchical communication structures. If this interpretation is tenable, our findings are consistent with the hypothesis of Blau and Scott that hierarchical structures function to facilitate coordination among group members by restricting inter-communication, while non-hierarchical structures are more effective in the production of new solutions. This interpretation suggests an approach to the measurement of relevant facets of organizational climate through analysis of communicative relationships, an approach that might alleviate dependence upon the kinds of subjective measurements of climate used in this study. Two directions for research using such an approach may be mentioned: (a) an attempt to confirm the pattern of relationships observed in this study using the "communication pattern" definition of climate, and (b) a study of the relationship between such a measure and the subjective measures we employed.

Cognitive and personality factors were studied separately and individually in this study. Some further hypotheses concerning configural relations between these variables and innovative behavior are relevant. We may conceptualize the cognitive aptitudes as representing ability or "maximum performance" aspects of creativity, while personality factors represent stylistic or "typical performance" aspects. It is plausible that stylistic tendencies would be more likely to result in behavior describable as innovative when ability to be innovative is present. Thus, we would expect that the personality variables which are related to innovative behavior would be more highly related to innovative behavior when a composite score on cognitive variables is high than when the composite score is low. Another group of configural hypotheses is suggested by the results of Getzels and Jackson (1962) regarding intelligence and cognitive creative ability in high school students. It would be interesting to compare subjects whose composite scores are higher than would be expected on the basis of regression of a test of general mental ability scores on the composite, with those whose composite scores are lower than would be thus expected.

Our interpretations of the evaluation of the experimental seminars suggested that two processes are involved in successful education for innovative behavior: a change in set or attitude, and acquisition of the relevant skills. It was suggested that the "insight" approach can have an effect upon attitudes independently of the training of skills; the cognitive aptitude approach, however, has less effect on attitudes, and can be effective in increasing skills only when used in conjunction with an attempt to increase insight into innovative processes. These interpretations could be tested by comparing the experimental seminars based upon the two approaches considered in the present study with an integrated seminar, combining the elements of the two approaches with appropriate controls for length of the programs, characteristics of instructors, etc. The results that would be expected from such an experiment are (a) that the "insight" treatment would have some effect upon attitudes, but little if any upon skills; (b) that the "cognitive aptitude" approach, in isolation, would have little effect on either attitudes or skills; and (c) that the integrated approach would have an effect on both attitudes and skills.

A question particularly in need of investigation in the area of executive education concerns the predictability of whether or not a given executive can and will profit from a particular educational experience. It is suggested that this question be studied, using cognitive aptitudes, personality variables and general mental ability as predictor variables. It is likely that there will be an interaction between personal characteristics and the kind of seminar from which an individual would profit most. For example, individuals whose personal need systems already emphasize individual, "go-it-alone" tendencies (e.g., autonomy, aggression) might be expected to profit most from a cognitive skill oriented program, while those whose need systems suggest tendencies toward interpersonal dependency (e.g. succorance, affiliation, abasement) might profit more from a personality-insight program. A similar question stemming from our conclusion that administrators who perceive their organizations as rule-centered may be more sensitive to educational innovation programs than are those who perceive their organizations as group-centered -- would involve an investigation of the effect of climate upon the likelihood of an individual's profiting from a particular educational experience. An attempt might be made to confirm our interpretation with climates defined in terms of communication patterns as suggested above. Such an investigation could be coupled with personality measurement to assess the relative contribution of objective characteristics of organizations, and personal characteristics of participants as determinants of the likelihood of educational profit.

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Some Pedagogical and Methodological Implications of our Research

William L. Libby, Jr. and Bernard J. James

Criteria for Assessing Success

[illegible] common criteria for assessing the success of courses in creati[illegible] test which calls for the subject to write as many uses as he can think of for a well known object. For example, the "Brick Uses" test from Guilford which asks the subject to write as many uses as he can think of for a brick (which we used), the AC Test of Creative Ability, Part V, item which calls for the subject to list all possible uses for a wire coat hanger, or Guilford's "Unusual Uses" Test requiring a subject to list different uses for some common objects. Such tests may be scored for quantity, quality and uniqueness of responses. (In the language of our courses, quantity indicates fluency while quality indicates flexibility.) Empirically, the quality and quantity scores have commonly demonstrated such a high order of relationship[1] that the tests may be scored for quantity only -- and the resulting score used for a measure of quality as well as quantity.

The rationale behind the use of such tests is that they may measure ability or "maximum performance" -- that is, a cognitive skill -- rather than individual style or "typical performance" -- that is, a personality variable. Our results question the validity of this criterion. Listing uses for a common object seems to involve a combination of cognitive skills and stylistic components analogous to the "equivalence range" of "cognitive controls" currently being researched by

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[1] See, e.g. Parnes, S. J. and Meadow, A., "Effects of 'Brainstorming' Instructions on Creative Problem Solving by Trained and Untrained Subjects" Journal of Educational Psychology, 1959, 50, 4, p. 175.

R. Gardner, G. Klein and their associates. In so far as the stylistic component is involved, the implication is that an individual may be taught relatively easily to improve his performance on this type of test.[2]

Although it is possible that such an improvement may indicate a lasting and relatively pervasive change in thinking style -- which could be interpreted as increased level of creativity,[3] it is also possible that we are concerned here with an artifactual improvement in verbal test score. It may not extend beyond the testing situation. This latter interpretation is given some support by our results. While both of our types of courses resulted in an improvement of scores on the "Brick Uses" test beyond the .01 level of significance, the subjects given our "cognitive-skills" treatment actually showed increased scores on the "Dogmatism" scale. They became more dogmatic and there was also a decrement in superiors ratings of them.

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[2] The effect of varying instructions on scores of this kind of test is demonstrated by Meadow, A., Parnes, S. J. and Reese, H., "Influence of Brainstorming Instructions and Problem Sequence on a Creative Problem Solving Test," Journal of Applied Psychology, 1959, 43, 6, 413-416, and Parnes, S. J. and Meadow, A., op. cit., pp. 171-176. However, their research does not bear directly upon this problem, since their instructions call either for "brainstorming" or "good" solutions only -- the former may be expected to evoke fewer responses than the standard Guilford instructions, while the latter may be expected to evoke more. An estimate of the order of the effect involved can be formed by comparing their mean for non-course group under brainstorming instructions of 5.29 (Table 4 in the Parnes and Meadow article) with the quality mean for experimental group of 7.46 reported in Parnes, S. J. and Meadow, A., "Evaluation of Persistence of Effects Produced by a Creative Problem-Solving Course," Psychological Reports, 7, 1960, 357-361. Since the standard deviation is not reported it is not possible to assess the level of significance of their course effects under this assumption. It seems clear that the effect would involve a reduction of this level. However, since two sets of instructions ("brainstorming" and standard Guilford) are involved, the comparison can only be considered heuristic, even though the same object, a "wire clothes hanger", is involved in each case. In the case of training we suggest that there is a difference in the pre-training and post-training meaning to the test subject contained in the standard Guilford Test instructions. In the pre-training situation the instructions would seem to call for "good solutions only" while in post-training situation instructions seem to elicit a "brainstorming" approach.

[3] See, e.g. Parnes, S. J. and Meadow, A., loc. cit.

Subjects who received the "personality-insight" oriented course, and who also improved performance on "Brick Uses" beyond the .01 level, became significantly less dogmatic (improved on the "Dogmatism Scale") and obtained higher ratings by superiors. None of our subjects improved on the Remote Associates Test or on our Guilford tests, other than "Brick Uses." In view of this interpretation it is suggested that in future applications of the "Brick Uses" type of test in assessing changed performance due to courses on innovation, researchers may need to control the "stylistic" component of the score.[4]

Pervasiveness and Duration of Course Effects:

We are concerned here with the kind of variables which virtually all educational efforts have in common: length of course, class size, range of pedagogical techniques employed, nature of teachers and students (as individuals and as a group) and instructional setting.

The length of course and class size are intimately related to the range of teaching techniques which can be employed. In any educational program we encounter the purely economic question of using techniques that will maximize course effect. It is our belief that fifteen hours of teaching time is insufficient to produce a substantial change in level of innovative thinking. This is particularly so when the usual three hours of homework per class hour is precluded. Moreover, as we have already noted above, for our courses optimum class size is about twelve persons. Learning is intimately related to the personality factors and cannot be forced under mass production conditions. A full semester (30 hours), combining cognitive-skills and personality-insight approaches seems indicated. It would permit introduction of the wide range of techniques we believe necessary to secure satisfactory change.

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[4] It should be noted that Maltzman, I., Simon, S., Raskin, D., and Licht, L., "Experimental Studies in the Training of Originality," Psychological Monographs, 1960, 74 (6, Whole No. 493), failed to secure a training effect on the Guilford "Unusual Uses" test after training on the items of that test. Thus adoption of our suggestion should be taken in a context of research on creativity training assessment criteria. Such research might specifically focus on the relative ease and superficiality of improvement on various criterion tests, as well as the more difficult question of the interrelationships of simpler, more assessible criteria with more valid criteria for the identification of creative behavior.

As noted elsewhere in this report, our cognitive-skills approach, on its simpler levels, reduces the role of the instructor to that of an administrator who presents practice devices to participants. Thus we see few obstacles, other than development costs, to the development of automated teaching of the basic skills in innovative thinking. However, on more complex levels the need for discussion and personal attention appear indispensable. A combination of the two approaches, an automated cognitive-skills method, and a personality-insight focus might be used simultaneously. Such a course ought to involve the characteristic opening-closing phasic alternation we discussed above. "Closed" practice would alternate with "open" instruction and participant interaction.

A more complete course along these lines should probably employ Torrance's memory-evaluative-integrative reading sets, John's[5] PSI machine, the role playing techniques of Stanton and Litwak,[6] extensive use of the Kelly fixed role-play concept including fixed group-role-play,[7] situational problems,[8] the Gordon technique[9] (which subsumes brainstorming -- insofar as we see its relevance to training executives[10]), application of innovative thought to participants' own job related problems[11] and the extension of insight into the creative process well beyond the individual and small group levels into complex organizational and cultural problems.[12]

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[5] John, E. R., "Contributions to the Study of the Problem-Solving Process," Psychological Monographs, 1957, 71, 18.

[6] As suggested in Foote, N. N. and Cottrell, L. S., Identity and Interpersonal Competence, Chicago: U of C Press, 1955, p. 57; as later developed and reported in articles by Stanton and Litwak.

[7] Fixed group-role play in class would, we believe, help hold participants "in role." Role descriptions could be tailored to lock into group functions. A crucial factor in fixed role play -- practice in a psychologically "safe" setting, before introducing the role into familiar situations, might be provided for in this way.

[8] See Maier, N. R. F., Reasoning in humans: II The solution of a problem and

The differential effects among our "democratic" and "bureaucratic"[13] oriented students would seem to suggest the need for care in matching students, courses

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its appearance in consciousness, J. comp. Psychol., 1931, 12, 181-194; Duncker, K., "On problem solving," Psychol. Monographs, 1945, 58 (whole No. 270); Hilgard, E. R., in Anderson, H., Creativity and Its Cultivation, N. Y.: Harper & Brothers, 1959; Scheerer, M. and Huling, M. D., "Cognitive embeddedness in problem solving, a theoretical and emperimental analysis," in Kaplan, B. and Wapner, S., Perspectives in psychological theory. See also later papers by N. R. F. Maier and Hoffman, L. R., e.g. "Quality of first and second solutions in group problem solving," J. of appl. Psychol., 1960, 44, 4, 278-283.

[9] See Gordon, W. J. J., "Operational approach to creativity," Harvard Business Review, 1956, November-December, p. 41.

[10] The value of exposure to foreign ways of thinking through individual-group interaction is a primary asset of brainstorming, along with any other group discussion. The suspension of judgment in brainstorming probably results in more exposure per minute of class time and thus should not be ignored as a training technique even though its economical use as a practical idea-getting gimmick has been questioned by Taylor, D. W., Berry, P. C. and Block, C. H., "Does group participation when using brainstorming facilitate or inhibit creative thinking?" Yale Univer., Department of Industrial Administration and Department of Psychol., November, 1957, Technical Report 1, Prepared under contract Nonr 609(20) (NR 150-166) for Office of Naval Research.

[11] This is particularly important in relating the new concepts to one's own private construct system -- so much so that it seems to be emphasized by almost all courses in applied creative thinking, e.g. courses by S. J. Parnes at the University of Buffalo, even in their intensive three day conference courses.

[12] See below.

[13] The "democratic"-"bureaucratic" dimension is measured by subject's own perceptions of his organization on the Nelson Questionnaire described elsewhere in this report.

and teachers.[14] But our most successful results were achieved when there was interaction between type and course and organizational climate as perceived by the student. Students who perceive their organizations as "bureaucratic" became markedly less "dogmatic" in the "personality-insight" course. Others, as we noted, actually became more dogmatic.[15] The implication is that innovative training may be selective in nature. A course or experimental treatment may enhance innovative behavior in one person and not for another.[16] It seems that more research is necessary before we can safely identify the type of creative training suitable for given individuals. Such research might well be undertaken in conjunction with "climate" studies of organizations. We can say tentatively that innovative training of our personality-insight variety seems well suited for government executives who perceive their organizations as "bureaucratic."

The nature of students as a group, the instructional setting, the realism of the training situation are closely related. Our students were drawn as individuals from various organizations and our courses were necessarily designed with this in mind. However, the studies by Fleischman, et al, of Ohio State, replicated by Nelson, indicate that isolated training of individuals drawn from organizations often does not persist. On the other hand, when training is given to entire units of organization it seems to be more lasting. The implication is that unless role expectations of superiors, subordinates and peers are also taken into account, an individual may not be able to adopt a new behavior successfully.[17] If this is true, the lack of significant change of specific ratings of innovative behavior by peers and superiors, as well as near significant change of superior's global ratings for subjects of the personality-insight course, may be interpreted to mean that innovative training of an isolated individual leads to improved performance ratings for them only in so far as the training improves overall performance levels.

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[14] Further research involving the instructor seems indicated. It may be, for example, that a relatively authoritarian type of teaching style may be successful with some students, but detrimental to others. The charismatic instructor may motivate some to lasting improvement, but fail in the case of others who improve with a teacher who serves as a catalyst for individual growth.

[15] "Dogmatism" is measured by the Rokeach Dogmatism Scale described elsewhere in this report.

[16] See for example also Maltzman, I., "On the training of originality," Psychol. Review, 1960, 67, 4, p. 237; and Maltzman, I., Simon, S., Raskin, D. and Licht, L., "Experimental studies in the training of originality," op. cit., describing failure to secure expected training effect on Guilford's "Unusual Uses" test after training on items of that test. A perhaps related phenomenon is reported by S. Maddi (personal communication) in work employing the TAT on novelty-seeking in humans. One experimental group was given a monotonous treatment designed to reduce search for novelty. Another was given a varied, interesting treatment designed to increase such behavior, while a control group was given no treatment. Post-experimental TAT scores reflected a decrease in novelty seeking for both experimental groups, but an increase for the control group -- entirely contrary to expectations.

There is evidence therefore that an increase of perceived innovative behavior by members of an organization can be best achieved when training involves larger segments of an organization. Such training may take an in situ form, in which all members of an organizational unit take part in classes as individuals. Or it might take the form of systems training in which organizationally functional units are trained.

This latter approach goes hand in hand with the task of making training relevant to organizational performance, that is, realistic. In business, this is the aim of the current "business games" as well as the "in-box" methods. An apparently even more realistic form for the business man has been described by Kepner and Tregoe,[18] involving both individual and group feedback on actual performance. A government analog of this type of training, focussing upon creative performance, would seem very desirable. It would involve realistic training of organizational units in personally meaningful problems.

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[17] Since the Fleischman, et al, findings concern human relations training, while ours concerns creativity, it does not necessarily follow that there is a direct analogy.

[18] See Kepner, C. H. and Tregoe, B. J., "Developing Decision Makers" Harvard Business Review, September-October, 1960, p. 115.

Implications for Curricula in Innovative Behavior:

It will be recalled that our experimental program involved a dual focus upon (a) improving the level of an individual's own innovative capacities and (b) enhancing his appreciation of such behavior in others. (The latter especially contribute to the overall receptivity toward, and encouragement of, innovative behavior throughout the social system in which the individual functions.) Our cognitive-skills course emphasized the first goal; the personality-insight course emphasized the second. The fact that the personality-insight course accomplished all that the other course did and more (achieving a significant effect upon attitudes as well as a statistically near-significant effect upon superiors' global ratings), has some interesting implications for educational stimulation of innovative behavior.

For some sixty years, educational specialists have been concerned with the design of integrative curricula which incorporate creative thinking processes into the educational system. However, recent research by psychologists (e.g. Getzels and Jackson at Chicago and Torrance at Minnesota) suggest that despite such efforts the present educational system is not optimally successful in developing creative or innovative behavior.

Anticipating recent research findings, courses were developed outside academic circles during the 1950's which aimed directly at stimulating individual innovative thinking processes. Such courses have been largely technique-oriented. They aimed at instruction and practice in such techniques as "brainstorming", "buzz groups", "the Gordon method", "morphological analysis", etc. However, there has been little emphasis in such courses upon teaching the individual to appreciate innovative behavior patterns in others.

If we agree with the criticisms of traditional education because of its indifference to creative thinking, questions arise as to appropriate improvement. There seems to be some question as to the place of technique-oriented courses, regardless of their scientifically demonstrated validity, in the formal academic curriculum. The success of our personality-insight course suggests an alternative. In addition to educating teachers to identify and encourage creative talent and manipulation of educational rewards (e.g. nature of examinations) it favors a change of "climate" regarding innovation. We suggest that training for innovative behavior is not something new and foreign to present academic approaches but that it can be woven into the fabric of traditional education.

The creative process, as we see it, is comparable to Piaget's learning processes of accommodation and "assimilation."[19] Our findings suggest that insight into, or understanding of the process on the part of the student, enhances both his own level of innovative performance[20] and his acceptance of the process in others. Such an understanding is closely related to the notion of the liberal education. The difference lies in the tendency of the traditional approach to focus upon memorization and convergent thinking -- reward of intelligence in the

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[19] Piaget, J., The Psychology of Intelligence, New York: Harcourt, 1950. This adaptational concept of intelligence should not be equated with the traditional I.Q. concept. The "opening"-"closing" notion appears to subsume both innovative behavior and intelligence (or learning) in Piaget's sense.

[20] See Shands, H. C., Thinking and Psychotherapy, Cambr., Mass.: Harvard University Press, 1960, esp. pp. 111-113, which discuss the role of awareness (which we interpret as understanding or insight) in learning a skill, with application to thinking. And p. 268 where he comments that "Only after a considerable level of sophistication has been reached, does the group begin to examine techniques of learning a process differentiated from the simple learning of techniques."

I.Q. sense -- instead of upon critical integration and the use of divergent thinking.[21] Thus, liberal education provides the student with many perspectives, but tends to compartmentalize his mind in so doing. It seems to place little emphasis upon direct understanding of the thinking processes themselves. This is, to be sure, understandable in light of the poverty of empirical knowledge of the creative thought up to the 50's.

We suggest that adequate understanding of innovative behavior involves grasp of cognitive and personality processes as well as their interrelation with social psychological processes. The interrelation of the self-concept, group norms, "conformity" and "deviance" are of particular interest here. We are concerned with such cognitive processes as perception, Gestalt-formation, intuition, infralogic and the problem-solving sequence. Creative solution finding is required when no precedent or algorithm exists. From this point of view, heuristic methods -- mathematical, attitudinal and personality-determined -- confront the student with complex psychological and mathematical dimensions. Innovative behavior on the group or societal level involves processes analogous to those of the individual. Appropriate treatment of these processes extends beyond the domain of psychology to sociology and cultural anthropology.

In the closure phase of innovative thinking we are concerned with criteria for evaluating solutions. The broad criteria required in creative solutions involve many fields such as (a) economics (especially the economics which determine the strategy for adapting different solutions), (b) sociology (especially that which relates to the measurement of innovation acceptance), (c) ethics and law (relating to legality of adoption), and aesthetics (relating to the beauty or pleasure implied by a particular solution). Though we do not pretend to suggest that studies in innovation acquaint the student with all these fields, their relevance in selecting solutions can be made clear by appropriate pedagogy.

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[21] See Getzels, J. W. and Jackson, P. W., Creativity and Intelligence, New York: Wiley, 1962.

We do not propose to discuss such questions as to the educational level at which specific material on innovation should be introduced. This varies, clearly, from grade through graduate school. We wish merely to outline areas with which it seems directly related. We indicate in parenthesis the traditional field concerned:

1. Thinking, personality, and group process (psychology and social psychology
2. Thinking, problem-solving and decision-making (psychology, philosophy and mathematics)
3. Organization and the social macro-system, including sociological and cultural anthropology relevant to individual innovative processes (sociology and anthropology)
4. Economics -- especially the cost-benefit ratio of innovation (economics)
5. A course near the end of the student's formal education in which he is required to integrate his study experience and relate it to his own interests (psychology and philosophy)

Difficulties which impede introducing such material into the curriculum, in order to acquaint the student with the nature of innovative behavior, regardless of his field, seem to be the following: (1) course content, teaching and student characteristics may need to be at least partially matched, (2) much of the psychological research data on thinking is relatively new and to some extent controversial, (3) some inter-disciplinary cooperation in teaching would seem necessary to make such courses feasible, (4) compartmentalized approaches within the disciplines (e.g. the traditional divorce of cognition and personality in psychology) may inhibit an integrative approach, (5) instructors qualified to teach such courses, especially a final integrative course, may be rare. Nevertheless, these difficulties do not appear insurmountable.

Section VII

APPENDICES

A. The Peer-Superior Questionnaire

B. The Organizational Perception Questionnaire

Appendix -A

A Request and an Explanation --

The Center for Programs in Government Administration of the University of Chicago is conducting research on executive development for administrators in the Federal Government. The project includes study of the characteristics of actual and potential candidates for executive development programs and the development and evaluation of special seminars. This work is being supported by the Office of Education, United States Department of Health, Education and Welfare.

During the Winter and Spring of 1961, several hundred federal executives are participating in our study. They spend a full day with us, taking tests and filling out questionnaires, giving us a wealth of data about the abilities, attitudes, interests and traits of potential executive development trainees. In order that this information be useful for developing educational programs, it is imperative to study its relevance to the on-the-job performance of the executives. For this reason, we are sending this questionnaire to organizational associates of the participants. The participants know that the questionnaire is being sent and already have had an opportunity to examine a copy of it.

The person named on the attached questionnaire is one of these participants in our study. Will you please help us by completing the questionnaire with respect to this person? These data will be used for research purposes only. The questionnaire will be seen only by University of Chicago research personnel, and their contents will be held in complete confidence. The questionnaires will be coded and the data transferred to punched cards for analysis. No individual or organizations will be identified in research reports.

Our experience indicates that the questionnaire takes about thirty minutes to complete. The generosity of you who contribute to the project by providing this data is greatly appreciated. We believe that the study will provide firmer foundations for the design of programs in executive development for federal administrators.

I

Instructions

On the following pages, a number of statements which may be descriptive of government executives are presented. Some of the statements are applicable in certain kinds of situations. In these cases, the situations are described briefly in capital letters followed by a statement which might (or might not) describe an executive under these circumstances. Here is an example:

> WHEN A DECISION REQUIRES EXPERT ADVICE FROM OUTSIDE HIS OWN SPECIAL COMPETENCY: Obtains, evaluates, and makes intelligent use of the advice of competent specialists.

In other cases a statement might apply to the general activities of the individual in any kind of situation. In these cases, a simple statement which may be descriptive of an individual is given. For example:

Writes reports which are clear and concise.

Although the qualities are all expressed in complimentary terms, it is unlikely that even the best executive can be described by all of them, or even by a substantial portion of them. Rather, a successful executive develops his own executive style emphasizing some qualities and deemphasizing others. For example, the statement:

Plans his work schedule a week in advance

may describe one executive and not another, while the two are equally "good" executives.

You are requested to read each statement carefully, and apply it to the research participant. Then mark the space to the right of each statement according to the following key

If the statement . . .

. . . Perfectly describes the participant, write 7

. . . Describes the participant most of the time, write 6

. . . Describes the participant when he is at his best, write 5

. . . Describes a quality which the participant exhibits sometimes, write . . . 4

. . . Describes a quality which you seldom expect of the participant, write . . 3

. . . Describes a characteristic which the participant exhibits but rarely, write . 2

. . . Could not be accurately applied to the participant, write 1

The key is summarized for your convenience on each page of the questionnaire.

PLEASE RESPOND TO EACH STATEMENT, even if you don't feel sure of yourself in answering. If you wish to make a reservation or elaboration, please do so in a marginal note.

Name of Research Participant:____________________

Name of Person Completing Questionnaire:____________________

1. Takes initiative in making decisions when appropriate even if it means "going out on a limb." ____
2. WHEN DECISIONS INVOLVE TECHNICAL KNOW-HOW: Has required knowledge and embodies technical consideration in judgments skillfully. ____
3. Considers a wide variety of alternatives before reaching a decision. ____
4. WHEN DECISIONS ARE INTRICATE, INVOLVING MANY TECHNICAL, ORGANIZATIONAL AND HUMAN FACETS: Discriminates accurately the relative importance of the different components which enter into his final judgment. ____
5. Skilled in using and developing policy in decision situations. ____
6. WHEN A DECISION CANNOT REPEAT PAST SOLUTIONS OR BE MODELED AFTER PRECEDENT: Probes for fresh, new orientations before coming to final judgment. ____
7. WHEN TASKS REQUIRE WORK UNDER HEAVY DECISION PRESSURE, NECESSITATING ONE DECISION AFTER ANOTHER: Works well despite decision pressure. ____
8. Skillful in considering implicit, hidden aspects of a decision situation. ____
9. Scrupulously stays within the scope of his authority in arriving at decisions. ____
10. Keeps perspective with regard to central issues in a decision; is not distracted by over-emphasis on details. ____
11. Makes decisions appropriate for a person in his position if the organization is to function efficiently. ____
12. WHEN A SITUATION DEMANDS INNOVATION: Relies upon his own ideas and judgment. ____
13. WHEN DECISIONS MUST BE MADE BEFORE ALL FACTS ARE IN: Willing and able to make appropriate assumptions, so that decision may be completed before deadlines. ____
14. WHEN IMPACT OF ORGANIZATIONAL GOALS IS AN IMPORTANT ISSUE: Is skillful in recognizing the appropriate interests to be considered. ____

Key:

7	Perfectly describes the participant, write	7
6	Describes the participant most of the time, write	6
5	Describes the participant when he is at his best, write	5
4	Describes a quality which the participant exhibits sometimes, write .	4
3	Describes a quality which you seldom expect of the participant, write .	3
2	Describes a characteristic which the participant exhibits but rarely, write .	2
1	Could not be accurately applied to the participant, write	1

15. Bases judgments on a thorough, systematic analysis of the problem situation. ____

16. Capable of handling almost any executive-level job successfully. ____

17. Highly skilled in handling the phases of his work which require technical knowledge and competence. ____

18. Approaches problems with flexibility; able to change assumptions and orientations in order to arrive at workable new decisions. ____

19. WHEN BASES FOR DECISION ARE CLEAR AND DEFINITE: Makes correct judgment about appropriate action. ____

20. WHEN THE SITUATION CALLS FOR RESERVING JUDGMENT: Is willing and able to refrain from making a decision. ____

21. WHEN A DECISION IS COMPLEX, REQUIRING CONSIDERATION OF MANY FACTS, OPINIONS, AND POSSIBLE OUTCOMES: Takes into consideration all of the relevant information. ____

22. Avoids over-commitment, retains flexibility for adjusting to future developments. ____

23. WHEN DECISIONS INVOLVE STAFF MATTERS, FOR EXAMPLE, BUDGET, PERSONNEL, OR ACCOUNTING: Makes most effective judgments. ____

24. Works creatively to develop new and unusual solutions to the organization's problems. ____

25. Uses past achievements and failures in re-formulating program goals and making decisions about the next stages of an operation. ____

26. WHEN RELIANCE ON PRECEDENT IS APPROPRIATE: Evaluates carefully the relevance of past decisions. ____

27. WHEN DECISIONS MUST BE PUBLICY DEFENDED: Makes decisions whose quality and explicitness of bases makes them easily defensible. ____

28. Is discerning in coming to his decisions; penetrates to the core of decision situations. ____

29. Utilizes the full scope of his authority in arriving at decisions. ____

30. Able to free himself from binding preconceptions in coming to independent judgments. ____

31. Inspiring and effective as a leader within the organization. ____

Key:

7 Perfectly describes the participant, write 7
6 Describes the participant most of the time, write 6
5 Describes the participant when he is at his best, write 5
4 Describes a quality which the participant exhibits sometimes, write . . 4
3 Describes a quality which you seldom expect of the participant, write . . 3
2 Describes a characteristic which the participant exhibits but rarely, write . 2
1 Could not be accurately applied to the participant, write 1

32. Skilled at developing courses of action which are effective in implementing policy. ____

33. Carefully screens the "facts" which come to him for relevance and accuracy before using them in decision-making. ____

34. WHEN A DECISION DEPENDS HEAVILY ON CONSENSUS OF A GROUP OF PERSONS: Works out group agreement skillfully but accepts final responsibility. ____

35. WHEN FACETS OF A DECISION MUST BE CONCEALED FOR POLICY REASONS: Makes decisions of high quality and exercises proper discretion in reaching and implementing decisions entrusted to his care. ____

36. WHEN DECISIONS REQUIRE INVENTIVENESS: Maintains flexibility in developing a wide variety of approaches to a decision. ____

37. His decisions are as suitable for the long-run as for the short-run. ____

38. Displays prudence in making judgments, coming to wise and balanced decisions. ____

39. WHEN DECISIONS DEAL WITH GENERAL ADMINISTRATIVE MATTERS: Makes most effective judgments. ____

40. Expertly organizes and manages his operations. ____

41. WHEN NO RELEVANT PRECEDENT FOR A DECISION EXISTS: Recognizes irrelevance of previous decisions, and exercises judgment in making new decisions. ____

42. WHEN DECISIONS INVOLVE NEW AND UNSOLVED PROBLEMS: Is creative and imaginative in developing solutions. ____

43. Effective in handling interpersonal, human relationships. ____

44. Tackles decisions with assurance and self-confidence. ____

45. WHEN DECISIONS WILL BE REVIEWED BEFORE BEING IMPLEMENTED: Explains decisions clearly and documents decisions carefully for the reviewer. ____

46. In general, is an extremely competent manager. ____

47. Focusses attention carefully on the definition of the problem being considered. ____

48. Is quick to recognize when events require decisions to re-evaluate organizational practices or procedures. ____

Key:

7 Perfectly describes the participant, write 7
6 Describes the participant most of the time, write 6
5 Describes the participant when he is at his best, write 5
4 Describes a quality which the participant exhibits sometimes, write . . 4
3 Describes a quality which you seldom expect of the participant, write . . 3
2 Describes a characteristic which the participant exhibits but rarely, write . 2
1 Could not be accurately applied to the participant, write 1

49. Whenever he makes a decision, provides for checking the decision's adequacy as it is executed. ____

50. Able to develop and implement independent, innovative and original judgments. ____

51. Highly motivated, ambitious, and "self-starting" both with respect to organizational goals and to his own career objectives. ____

52. Avoids self-contradiction by insuring that his judgments are internally consistent and logical. ____

53. Expert in solving problems, analyzing situations and using his intellect. ____

54. Constantly re-evaluates his own methods and practices, adapting them to changing conditions when necessary. ____

55. WHEN THE ORGANIZATION IS IN A CRISIS SITUATION: Does not lose faith in the competence of himself and his associates. ____

56. Comes to his decisions cautiously, guarding against unwanted consequences. ____

57. Effective in applying judgment in decision-making situations. ____

58. Holds judgments until he is sure; seldom makes decisions on the spur of the moment. ____

59. WHEN DECISIONS TO BE MADE ARE RECURRENT AND ROUTINE: Performs most satisfactorily. ____

60. One of the best administrators I have ever known. ____

Key:

7 Perfectly describes the participant, write 7
6 Describes the participant most of the time, write 6
5 Describes the participant when he is at his best, write 5
4 Describes a quality which the participant exhibits sometimes, write . . 4
3 Describes a quality which you seldom expect of the participant, write . . 3
2 Describes a characteristic which the participant exhibits but rarely, write . 2
1 Could not be accurately applied to the participant, write 1

II

This part of the questionnaire is designed to permit a more explicit description of the executive style of the participant. On the following page are several pairs of adjectives. In each case both of the adjectives are complimentary when used to describe an individual, and either or both of them might be descriptive of a good executive. Here are two examples:

Decisive
Perceptive

Ambitious
Decisive

The task is to select and underline the one adjective of each pair which you think is more descriptive of the participant. For example, if you think that decisiveness is more characteristic of the participant than perceptiveness, you would underline the first adjective in the first pair; if you think that perceptiveness is more characteristic, you would underline the second adjective. Similarly, you would consider whether ambition or decisiveness is more characteristic of the participant, and mark the second pair accordingly.

The selection may be difficult, since all of the qualities are desirable. Please make a selection however, even though the choice is close. If you wish to express a reservation or make a comment, please do so in a marginal note.

Remember, UNDERLINE THE ADJECTIVE IN EACH PAIR WHICH YOU THINK IS MORE CHARACTERISTIC OF THE PARTICIPANT.

industrious
dependable

inquiring
cooperative

self reliant
stable

original
dependable

prudent
independent

original
stable

industrious
prudent

inquiring
dependable

flexible
industrious

self reliant
original

flexible
independent

stable
cooperative

inquiring
independent

cooperative
flexible

inquiring
stable

original
industrious

flexible
stable

self reliant
prudent

cooperative
prudent

stable
independent

flexible
self reliant

original
prudent

independent
industrious

dependable
stable

prudent
flexible

independent
dependable

cooperative
original

self reliant
industrious

prudent
inquiring

self reliant
dependable

independent
cooperative

industrious
inquiring

self reliant
cooperative

flexible
dependable

independent
original

III

This final part of the questionnaire is designed to assess your conception of an ideal government executive rather than a description of an individual.

On the following page there are pairs of adjectives similar to those you have just seen. This time, please mark the pairs as you think they apply to an ideal government executive. Choose and underline the adjective from each pair which is the more characteristic of the ideal executive. Please mark every item, even if the choice is difficult, and note reservations and comments in marginal notes.

Please do not refer back to any other part of the questionnaire while filling out this part.

Remember, UNDERLINE THE ADJECTIVE OF EACH PAIR WHICH IS MORE CHARACTERISTIC OF AN IDEAL GOVERNMENT EXECUTIVE.

stable
self reliant

inquiring
industrious

flexible
prudent

stable
original

industrious
self reliant

inquiring
prudent

original
independent

cooperative
self reliant

stable
dependable

self reliant
flexible

cooperative
independent

dependable
original

independent
stable

dependable
self reliant

industrious
flexible

original
self reliant

dependable
flexible

cooperative
stable

independent
prudent

dependable
industrious

cooperative
inquiring

independent
flexible

prudent
self reliant

original
cooperative

stable
inquiring

dependable
independent

prudent
original

flexible
cooperative

independent
inquiring

prudent
industrious

stable
flexible

industrious
original

prudent
cooperative

industrious
independent

dependable
inquiring

Appendix -E

The Leadership Practices Survey*

Among the factors which influence an executive's performance -- and the effectiveness of executive development programs -- are the ways of doing things which are customary in the executive's organization. The following questions are designed to help us learn about characteristic organizational practices which affect executive development participants from government agencies.

Fifty problem situations are described. In each case, two alternative ways of dealing with the problem are stated. Both of the solutions may be valid, and both are solutions which some organizations would adopt. Please decide which solution you think would MOST PROBABLY be adopted in your organization, and mark an "X" in the space to the left of this statement.

Here is an example (more relevant to business organizations than to government agencies).

Sample Pair

Ex. If an employee repeatedly fails to make his production quota, the supervisor would probably

__X__ (a) try to develop the man's abilities and interests for another job.

_____ (b) give the man two weeks to improve or be fired.

If you think that alternative (a) would be more likely to be adopted in your organization than alternative (b), you would mark an "X" beside (a), as has been done here. If you think alternative (b) would be more likely to be adopted, you would mark the space beside (b).

It may be difficult to determine the organizational level in terms of which to reply. In general, "your organization" refers to the organizational level whose policies have the greatest day-to-day effect on your work.

If you are uncertain about which alternative to choose, please mark your best guess. Please mark one alternative in each pair, even if the choice is difficult.

---

*Adapted for research from a questionnaire by Charles W. Nelson of Management Research Associates.

THE LEADERSHIP PRACTICES SURVEY

1. A lower level supervisor is most helpful to his superior if he

_____ (a) disciplines employees who take unfair advantages of regulations to justify loafing on the job.

_____ (b) tries to help or advise individual employees who go to him to discuss their personal problems and complaints.

2. When usual methods fail to get action on an important problem, an administrator's best bet for getting results is

_____ (a) the advice and backing of his own immediate superior.

_____ (b) the employees, who can informally back his request for action.

3. A smooth-running unit within the organization depends mostly on

_____ (a) the understanding, responsibility, and teamwork developed by the work force.

_____ (b) the systematic breakdown of the work load into separate and clearly described job duties for each employee.

4. When an administrator gets an order that doesn't seem justified and that his subordinates dislike, he would probably

_____ (a) study the order; then either change it so that he can personally justify its enforcement or send it back up the line with his objections.

_____ (b) realize that everyone makes mistakes, and save his superiors unnecessary trouble by explaining the order in such a way that the employees will accept it.

5. When a man is recommended for promotion to supervisor, the most important thing to consider is his

_____ (a) understanding of, and respect for, official policies and programs.

_____ (b) standing among the employees as a leader.

6. Organizational discipline is maintained by trying to

_____ (a) see to it that each employee learns the organization's rules and can therefore be responsible for his own conduct.

_____ (b) take direct personal action on anyone who commits a serious violation of the organization's rules.

7. The best level of coordination between parts of an organization comes mostly from

_____ (a) training supervisors to handle minor problems between the parts of an organization diplomatically, to avoid unnecessary conflicts.

_____ (b) selecting unit supervisors who really know their work and take pride in competing with each other to get out first-class work.

8. Executive development programs most often concentrate on

_____ (a) the proper use of official channels and forms for making reports, filing complaints, handling transfers, requisitinning, etc.

_____ (b) how to understand the employees' ideas, problems, and standards.

9. If several employees are led informally by a very uncooperative individual, the problem would be handled by

_____ (a) asking the personnel department to have the leader transferred.

_____ (b) calling them all in and talk the problem through with them.

10. When hiring a new employee, the man most likely to be selected is one who is

_____ (a) intelligent and has a good deal of drive.

_____ (b) a hard worker and who doesn't need much supervision.

11. The best level of coordination between parts of an organization comes mostly from

_____ (a) having a clear-cut delegation of authority for each part of the organization so that there is absolutely no overlapping of responsibility between supervisors.

_____ (b) developing supervisory planning sessions in which the unit supervisors work out solutions to conflicts between parts of the organization.

12. When a major reorganization of the employees' work is necessary in his part of the organization, the administrator in charge of the unit would probably

_____ (a) ask the personnel department to reassign the employees impartially.

_____ (b) call the employees together and get their suggestions about the reorganization.

13. When an administrator gets an order that doesn't seem justified and that his subordinates dislike, he would probably

_____ (a) realize that there probably is a good reason for the order, and that if future orders are to be respected, this one must be carried out.

_____ (b) explain to his subordinates that as supervisor he must see that the order is carried out, but that he'll help them organize their criticisms of it for presentation up the line.

14. An ideal administrator

_____ (a) avoids use of authority, and respects the employees' opinions and attitudes while helping them to work out common standards and methods of efficiency.

_____ (b) avoids making snap judgments, and distributes both duties and privileges impartially.

15. Administrators get the highest production from employees by

_____ (a) helping them work out standards and teamwork that fit current needs.

_____ (b) seeing that the work is carried out according to the specific instructions given by higher management.

16. Organizational discipline is maintained by trying to

_____ (a) help the employees work out a common standard of action based on the rules.

_____ (b) treat all employees alike and according to the established rules.

17. When hiring a new employee, the man most likely to be selected is one who is

_____ (a) open-minded and willing to share responsibilities.

_____ (b) agreeable and willing to follow the regulations.

18. Executive development programs most often concentrate on

_____ (a) the basic technical knowledge the executive will need in the part of the organization he is supervising.

_____ (b) the ways to deal with individuals efficiently without causing friction.

19. An ideal administrator

_____ (a) avoids "passing the buck," and makes prompt, firm, clear decisions that his employees will respect and follow.

_____ (b) avoids unnecessary conflicts, and uses praise and personal attention to help each individual develop his abilities.

20. Administrators get the highest production from employees by

_____ (a) using psychology to aid each individual in developing himself to his highest potential.

_____ (b) using their own practical knowledge, initiative, and organizing ability to run his part of the organization at maximum efficiency.

21. When the usual methods fail to get action on an important organizational problem, an administrator's best bet for getting results is

_____ (a) his own organized and forceful presentation of the facts.

_____ (b) his informal personal contacts with key people in the organization.

22. A smooth-running unit within the organization depends mostly on

_____ (a) how well the unit supervisor helps each employee to realize and use his abilities.

_____ (b) how well the unit supervisor plans and directs the work.

23. The rating or promotion of an employee is usually based primarily on

_____ (a) the ambition and ability to learn that he has shown.

_____ (b) his technical knowledge and ability, and his organizational experience.

24. If several employees are led informally by a very uncooperative individual, the problem would be handled by

_____ (a) discrediting this rival leader by showing the group how and where he is wrong.

_____ (b) interesting the leader in something else, and giving the men more individual attention.

25. If an employee keeps coming in with an unreasonable complaint, an administrator would try to

_____ (a) help him to become interested in something more constructive.

_____ (b) politely but firmly show him just why the complaint is not justified.

26. To understand how the employees really feel about things, the administrator would probably try to

_____ (a) maintain a frank, informal, give-and-take relationship with them.

_____ (b) keep objective records of things that reflect their feelings -- like production, absenteeism, suggestions, and complaints.

27. The real function of staff specialists is to

_____ (a) develop reliable methods and programs that the administrator can use and depend on.

_____ (b) provide qualified people that the administrator can call on when his organization needs help in solving problems.

28. To make sure that official policies are really followed, they are

_____ (a) clearly presented in an organizational manual or handbook, with the names of the authorities to consult when any questions come up.

_____ (b) presented as general guides for the employees, who are able to get unpopular policies reconsidered.

29. An employee's suggestion for an improvement in his organization is likely to be

_____ (a) passed up through the supervisor, whose knowledge of the technical needs of the organization may enable him to inprove the suggestion.

_____ (b) encouraged by the unit supervisor, so that the employee's initiative is developed and supported.

30. The usual method for training a new employee is to

_____ (a) showing him repeatedly how to do the job, until the supervisor sees that he's developed efficient work habits in it.

_____ (b) making the job interesting to him by praising him when he does it well and correcting him tactfully when he shows his weak points.

31. A new employee will get along all right if he

_____ (a) really tries to take advantage of opportunities to improve himself.

_____ (b) follows the supervisor's instructions and develops the right work habits.

32. The usual method for training a new employee is to

_____ (a) give him a complete written set of instructions to study, so that he can learn the right methods from the start.

_____ (b) explain what the job requires, then allow him to develop his own methods from the supervisor's suggestions and his own experience and knowledge.

33. If an employee keeps coming in with an unreasonable complaint, an administrator would probably

_____ (a) talk the problem over with him, trying to understand how he feels about it.

_____ (b) send him up the line to the proper authority for an official and final answer that the employee will have to accept.

34. Informal personal relationships between superiors and subordinates are

_____ (a) generally avoided, except when the employee has been outstandingly responsible in his work and would make a good assistant in the organization.

_____ (b) encouraged, so that the supervisor can get to know each man's interests and stimulate him to develop his abilities.

35. The best way to get steady and dependable production is

_____ (a) praising employees when they deserve it, and appealing to their desires for self-improvement.

_____ (b) careful direction and disciplining of employees.

36. New orders and information are normally given out by

_____ (a) discussing them with the employees and getting their questions and comments.

_____ (b) sending written notices to every employee concerned.

37. The best way to get steady and dependable production is

_____ (a) to establish a pay schedule based on a job evaluation.

_____ (b) through the employees' desire to be part of a satisfying work team.

38. When a man is recommended for promotion to supervisor, the most important thing to consider is his

_____ (a) ability to use practical psychology in getting things done.

_____ (b) technical ability, initiative, creativity, and experience in the organization.

39. When a new program begins, the administrator needs to get

_____ (a) enough information and freedom in carrying it out so that he can meet the personal needs of individual employees.

_____ (b) firsthand information about his duties, and personal authority to carry them out in the way he thinks best.

40. A new employee will get along all right if he

_____ (a) works with the other men in his organization in turning out the day's production.

_____ (b) follows the rules and regulations and is reliable.

41. A lower-level supervisor is most helpful to his own superior if he

_____ (a) evaluates each employee's complaints and passes on only those which are legitimate grievances under the regulations.

_____ (b) helps the employees to organize and present their ideas about organizational problems.

42. To understand how the employees really feel about things, an administrator would probably try to

_____ (a) arrange for informal private interviews with each employee.

_____ (b) notice their reactions to the work, to him, and to his orders.

43. New orders and information are normally given out by

_____ (a) explaining the orders or information to each employee concerned.

_____ (b) telling each employee about them informally at the appropriate time and place.

44. An employee's suggestion for an improvement in his organization is likely to be

_____ (a) passed around among others in the organization for their comments and suggestions before it's sent up.

_____ (b) dropped directly into the suggestion box or routed through channels and then considered objectively by the suggestion committee.

45. To make sure that official policies are really followed they are

_____ (a) laid out as general rules that the unit supervisor is authorized to interpret and apply in his organization.

_____ (b) set up as general guides that the supervisor can change slightly to fit individual cases and problems.

46. The rating or promotion of an employee is usually based primarily on

_____ (a) objective records showing the amount of experience he's had, his length of employment, and his job skills.

_____ (b) the recommendations of a supervisor-employee merit-rating committee.

47. The real function of staff specialists is to

_____ (a) provide factual material that the administrator can use in building up the technical efficiency of his own organization.

_____ (b) provide the administrator with new ideas that he can use to stimulate his men and keep them interested in improving their efficiency.

48. Informal personal relationships between superiors and subordinates are

_____ (a) accepted the same way as any other friendship in which there is mutual respect of one another's opinions and individuality.

_____ (b) avoided, because a superior who mingles with his subordinates loses their respect of him as a fair and impartial judge of their merits.

49. When a major reorganization of the employees' work is necessary in his part of the organization, the administrator in charge of the unit would probably

_____ (a) use this opportunity to shift employees to jobs where each of them will feel happiest and thus work best.

_____ (b) use his own judgment and assign each employee to the kind of work the supervisor knows he does best.

50. When a new program begins, the administrator needs to get

_____ (a) advance information about the program, so that he can get his employees' ideas about it and then help develop it.

_____ (b) a clear description of his duties in the program, and a statement that he'll have the official backing needed to carry them out.